HE SKIN

M.D.

NSAS SCHOOL OF MEDICINE;
OF THE AMERICAN MEDI-
STATES NAVY, RE-
SON HOSPITAL.

NS, AND ELEVEN

M.D.

DISEASES OF THE SKIN

BY

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PREFACE TO THE THIRD EDITION.

In this edition an effort has been made to cover all of the important dermatological literature up to the beginning of the present year. While the war has had a deterrent effect upon the study of cutaneous medicine in general, it has added to our knowledge of the successful management of a few disorders, notably those due to animal parasites; and has developed a few new affections, such as occupation and traumatic dermatoses due to tetryl, dichlorethylsulphide and similar chemical irritants, and inflammatory and trophic disturbances resulting from long continued exposure to adverse atmospheric conditions.

The gravity of syphilis as a social disease is becoming more evident each year—a fact to which attention has been called by the splendid contributions of William Allen Pusey, John H. Stokes, Loyd Thompson, H. H. Hazen, and other authorities—and for this reason the malady has been accorded an even greater amount of space than in previous editions.

The important part played by focal infections of the teeth, tonsils, prostate, and other organs, in the causation of disorders of the skin, is at last becoming generally recognized; and I have endeavored to emphasize such a relationship in those conditions where it is known to exist.

Among the more recently discovered diseases of the skin, Erythema Figuratum Perstans, Necrobacillosis of the Skin, Folliculitis Ulerythematosa Reticulata, Barcoo Rot, Chondro-dermatitis Nodularis Chronica Helicis, and Retention Cysts of the Mucous Membrane of the Lip are described.

I am indebted to many colleagues for valued suggestions and advice, and particularly to my friend, Dr. Charles J. White, of Boston, whose encouragement and example have been constant sources of inspiration during my entire dermatological career.

Through the generosity of the publishers I have been enabled to add eighty new illustrations. The four hundred additional references to the literature have been carefully checked by Mrs. Rosa Hibbard, of the Kansas City Medical Library Club, and I believe will be found of value to research students and others who may desire to investigate exhaustively any particular subject.

RICHARD L. SUTTON.

PREFACE TO FIRST EDITION.

The present volume is the outgrowth of several years of study along this particular line, and is an attempt to present the entire subject of dermatology in a comprehensive, and, at the same time, concise manner.

A treatise covering so broad a field as that of diseases of the skin cannot well be based entirely on the personal knowledge and observations of any single individual. For this reason I have not hesitated to draw from the publications of other writers, selecting the material which I considered most appropriate. Every effort has been made to properly credit the ideas thus secured, and if any mistakes have been committed I trust they will be forgiven.

The symptomatology, diagnosis, and treatment of the various disorders are presented as clearly and simply as possible, and in the manner that I have found most effective in my college and university work.

Particular emphasis has been placed on pathology and treatment. As one of the pioneers in cutaneous medicine has said, no other organ of the body offers such inducements to the pathologist for study as the skin, and for this reason I have devoted more than the usual amount of space to this particular phase of the subject. The majority of the therapeutic measures recommended are those which I have found useful and practicable in my own private and dispensary practice.

The intention has been to advise rather than confuse the less experienced practitioner. Obsolete methods, and those of questionable value or of theoretical interest only, are discussed briefly and frankly, or omitted altogether.

Owing to the number of references given, it was thought best to dispense with numbered text citations. The appended lists of references will be found to contain practically all of the more important contributions to our knowledge of the various subjects, and have been carefully checked over by Mrs. Rosa Hibbard, and her assistant, Miss Elizabeth Cogswell, of the Kansas City Medical Library Club. I believe them to be accurate.

I am under obligation to Dr. George H. Simmons, Editor of the *Journal of the American Medical Association*, for permission to use several articles which were previously published in the Journal. I am also deeply indebted to numerous colleagues and friends in various

parts of the world for placing at my disposal their collections of photographs from which I have drawn freely.

While the greater amount of space has been devoted to the illustration of examples of the commoner disorders, such as eczema and syphilis, the rarer dermatoses have not been neglected, as examination will show. Several of these, such as uta, or espundia, cutaneous thrush, foot-and-mouth disease, and trichinosis, have never before been pictorially presented in any book, and I trust will prove of value from a diagnostic point of view.

RICHARD L. SUTTON.

Kansas City, Mo.

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DISEASES OF THE SKIN

ANATOMY.

Without an intimate knowledge of the anatomy and physiology of the skin it is impossible to comprehend thoroughly the pathologic changes which occur in it as a result of injury or disease. Macroscopically, the skin is a soft, flexible, membranous covering which completely invests the body and is continuous at the natural orifices with the mucous membranes. It serves as an organ of secretion and elimination, as well as protection and heat regulation, and because of these manifold functions it is necessarily intricate and complex in structure. Essentially it consists of a connective tissue framework, with the requisite blood vessels, lymphatics and nerves, the whole being protected by a covering of epithelium, the epidermis, which varies considerably in thickness and consistence on various parts of the body. Although attached to the underlying structures at several points, including the scalp, the lateral surfaces of the auriculae and the palms and soles, it resembles in many respects a closely-fitting, elastic garment. Much of its protective quality is due to the arrangement and distribution of the subcutaneous adipose tissue, which acts as a resilient cushion when pressure or force is applied to the external surface. Superficially, the skin is marked by frequent tiny wrinkles and furrows, and abundant numbers of minute openings, or "pores," by which the underlying glands communicate with the surface. On the palms, soles and flexor aspects of the fingers and toes numerous permanent ridges, the cristae cutis, occur. These elevations correspond with rows of underlying papillae. Over the terminal phalanges their arrangement in each individual is distinctive and characteristic, and is frequently utilized for purposes of identification.

The thickness of the skin varies considerably in different individuals and races. On the eyelids and prepuce it averages about 0.5 mm. in thickness and on the palms and soles 0.8 mm. or more.

Its color is determined partly by the pigment in the upper layers and partly by the blood in the lower strata.

For descriptive purposes, the structures comprising the skin may be divided into two groups; first, the skin proper, consisting of the epidermis, the corium or derma, and the subcutaneous connective tissue, together with the blood vessels, lymphatics and nerve fibers; and second, the appendages of the skin, embracing the hair, the nails, the sebaceous and coil glands, and the special nerve endings.

The subcutaneous tissue varies greatly both in thickness and in density on various parts of the body. Composed mainly of adipose material, it fills the spaces and irregular depressions occurring at various points on the surface of the outer fibrous structures and forms a smooth, uniform resilient base for the overlying true skin. Anatomically it consists of small masses or lobules of adipose tissue, irregularly arranged in a loose, fibrous network which also supports the blood and nerve trunks. The individual lobules are made up of collections of rounded or oval fat cells, each of which contains a nucleus and is usually surrounded by a thin, semitransparent membrane, but a real membrane is very probably not an essential attribute to a fat cell. In those regions where the integument is particularly thick, as on the back, Warren has demonstrated the occurrence of elongated masses of adipose tissue arranged in the form of columns, the columnae adiposae, which extend from the subcutaneous stratum upward to the bases of many of the hair follicles, particularly those of the lanugo variety. The axes of the columns lie almost parallel with the arrectae pili muscles, and many of them contain coil glands. Unna believes that these organs develop concurrently with the columnae adiposae and that the latter are indispensable to their growth and support.

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THE CORIUM.

The corium, derma, or true skin, is a thick layer of fibrous and elastic tissue which lies immediately beneath the rete or epidermis. It is thickest on the soles, palms and back, and thinnest on the eyelids and prepuce. Kölliker has estimated its thickness at from 0.3 mm. to 2.4 mm., and Landois at from 2.7 mm. to 3.3 mm. Anatomically,

it may be separated into two strata, a basal layer, the pars reticularis, which merges directly into the subcutaneous tissue, and a superficial layer, the pars papillaris, which supports the rete and is in intimate association with it. In its lowermost portion the pars reticularis merges into the subcutaneous tissue, the composition of the two layers being practically identical at the point of juncture. As one passes

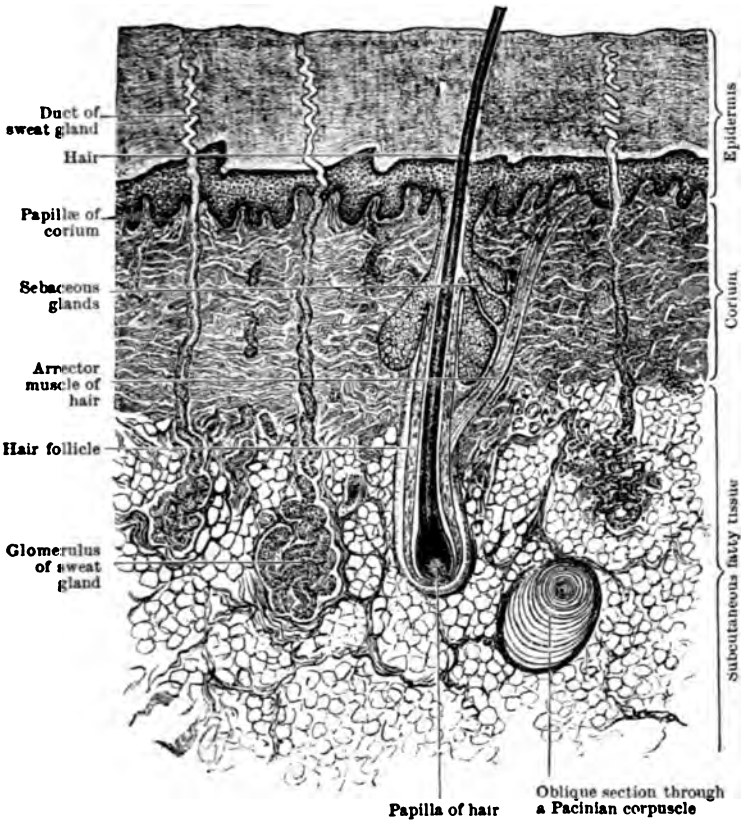

Fig. 1.—Vertical section of the skin (schematic). (Cunningham's Anatomy.)

upward, however, the lobules of fat gradually become fewer in number and smaller in size until their place is almost entirely taken by the interlacing bundles of dense white fibrous or collagenous tissue, the diamond-shaped fasciculi of which are filled with striated and non-striated muscle fibers, a few particles of fat, nerve trunks, blood vessels and lymphatics. Innumerable slender strands of yellow, elastic tissue are threaded through the entire mass. They surround the bundles of fibrous and muscular material, the sebaceous and coil

glands, the hair follicles and the blood vessels, and pass upward to terminate between the columnar basal cells of the epidermis. Pusey is of the opinion that these elastic fibers serve to hold all of these structures together and that the prolongation of the filaments between the cells of the stratum mucosum constitutes an important factor in binding the epidermis to the corium. His conclusions have been verified, in part at least, by the researches of Engman and Mook and myself on epidermidolysis bullosa, a disorder which is probably due to an acquired or congenital lack of elastic tissue in the

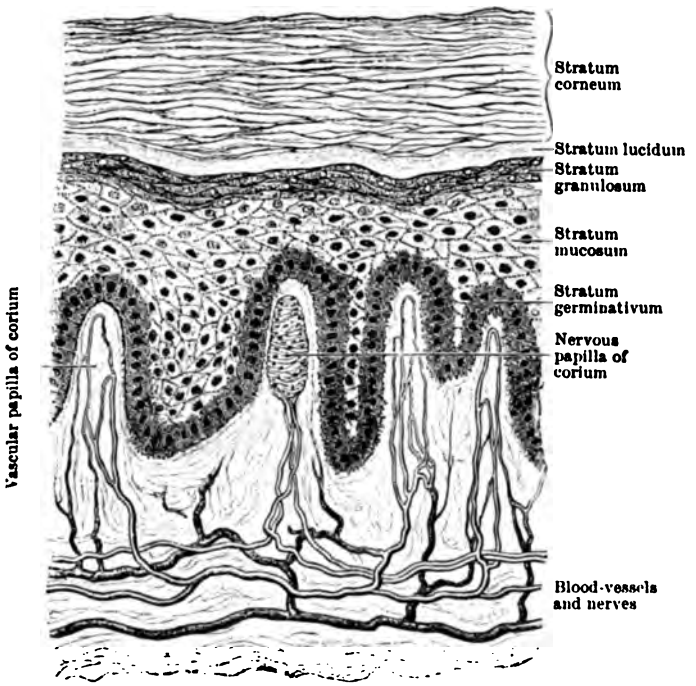

Fig. 2.—Vertical section of epidermis and papillae of corium, highly magnified. Semi-schematic. (Cunningham's Anatomy.)

papillary layer of the skin. The pars papillaris is that portion of the corium which extends from the basal layer of the rete down to the subpapillary level. It consists of a series of round or oval, cone-shaped projections, seated upon irregular, curved, ridge-like elevations of connective tissue. Simon has demonstrated that the arrangement of these ridges is largely dependent upon the longitudinal direction of the connective tissue bundles. On those parts of the body which are particularly sensitive to pressure, as the clitoris, nipple,

penis and tips of the fingers and toes, the projections lie very close together, while on the less sensitive areas they are more sparsely distributed. Sappey has estimated the total number of papillae in the skin of an average individual at 150,000,000, or about 100 to each square millimeter of surface. The projections vary from 0.01 to 0.05 mm. in width, at the base, and from 0.02 to 0.1 mm. in height. They vary in size, and are composed of fine bundles of collagenous substance, arranged parallel with their long axes A double capillary system is found in many of the larger ones (the so-called compound papillae), but usually the projections contain only a single vascular loop. In addition to the blood vessels, medullated nerve fibers and nerve endings occur in a considerable percentage of the papillae, particularly in those regions where the tactile sense is highly developed. The basal region of the epidermis lies in close apposition to the outer surface of the pars papillaris, and is in intimate association with it, both anatomically and physiologically. From below, upward, the epidermal elements may be separated into four distinct strata, the prickle layer, the granular layer, the stratum lucidum and the stratum corneum, and each of these, in turn, consists of one or more thicknesses of tissue of a particular type.

The prickle layer, rete malphigii, or stratum mucosum, lies next to the pars papillaris and is what might be called the generative or productive layer of the skin. The upper surface of the prickle layer is slightly undulating, but the under surface presents a series of finger-like projections which fit snugly into the interpapillary depressions of the corium. Its depth varies slightly in various parts of the body. The deepest cells, those next to the corium, are columnar or wedge-shaped, with the narrow ends downward. The cells immediately overlying these are also slightly elongated, but those in the higher planes are rounded or polygonal in form (the shape being largely a matter of mechanical pressure), soft and mucoid in character, distinctly nucleated, and rich in protoplasm. Their outer surfaces are apparently covered with innumerable short protoplasmic spines or prickles, of varying length, which give the individual cells a cockleburr appearance. The exact nature of these processes is not yet fully understood. First described by Schrön, in 1863, they have been studied by Schultze, Bizzozero, Lott, Ranvier, Unna and others. Unna believes them to be protoplasmic connecting bridges, which possess a slight degree of elasticity. The prickly sheathing consequently permits of the free circulation of nutritive lymph current between

the cells, and at the same time exercises an anchor-like function in binding the cells together. The most perfect examples of cells of this type occur in the skin of the fetus, and the spinous processes are much longer in young and growing cells than in the old or degenerative forms. Occasionally, a wandering lymphocyte forces its way into one of these interspinal spaces.

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Herxheimer's Spirals.—The occurrence of peculiar, extremely minute, spiral fibers in the prickle layer and, less frequently, in the outer strata of both the skin and mucous membranes, was first noted by Herxheimer, in 1889, and his observations have been verified by Eddowes, Jadassohn, Ehrmann and others. These slender fibers, which stain best by Weigert's method, usually begin at the corio-epidermal junction, and extend upward between the cells in an irregular, zigzag manner, not unlike the gnarled branches of a small tree. Herxheimer was of the opinion that they represented a system of juice canals. Owing to the fact that their size and numbers are increased during the process of certain inflammatory conditions which are accompanied by dilation of the lymph spaces and the deposition of fibrin, Jadassohn and Ehrmann believe them to be deposits of fibrin.

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Stratum Granulosum.—The stratum granulosum, or granular layer, is in reality a component part of the rete. It varies from one to four cells in depth, and extends in unbroken continuity over the entire surface of the body (Unna). The constituent cells are flattened or spindle-shaped, with well-defined nuclei, and lie parallel with the surface of the skin. They are filled with coarsely granular, refractile substance, probably a degenerative product of albumen, which stains deeply with basic dyes, and which Unna has named keratohyalin. Unna believes that these cells are intimately associated with the process of cornification, a view which has been opposed by Kromayer. Inasmuch as Waldeyer has demonstrated the presence of similar cells

in the medulla of the hairs and in the horny substance of various animals, it is probable that Unna's conclusion is correct.

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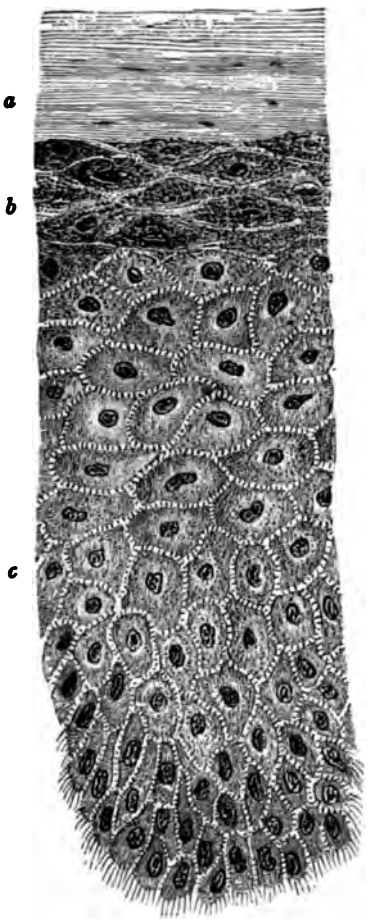

Fig. 3.—Section of epidermis, highly magnified. *a*, stratum corneum; *b*, stratum granulosum; *c*, prickle layer. (Bailey's Histology.)

Stratum Lucidum.—The stratum lucidum is a translucent, ribbon-like layer which separates the stratum granulosum from the stratum corneum. Unna regards it as the basal layer of the corneum. Histologically, it consists of three or four layers of large, clear, glistening, irregularly shaped cells, the majority of which contain shriveled

or disintegrated nuclei. This layer is most closely defined on the palms and soles, and Zander claims that it is typical of these regions only. Bowen[1] has shown that it stains deeply with dyes which have an affinity for horny tissue. The cells are closely packed together, and according to Pusey, many contain droplets of eleiden, a glycerine fat (Buzzi). It is probable, as Kaposi has suggested, that this layer is due to some chemicobiologic change which the granular cells must undergo prior to their transformation into horny cells.

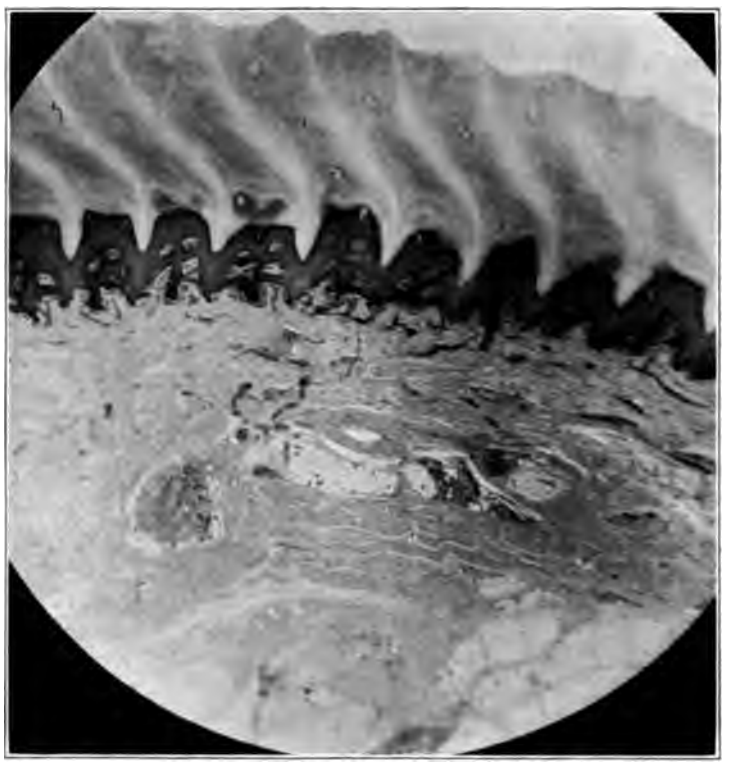

Fig. 4.—Skin from heel. Normal. Low magnification. (Courtesy of Dr. Frederick G. Harris.)

Stratum Corneum.—The corneous, or horny, layer is the outer and protective division of the skin. It consists of several layers of flattened or fusiform, imbricated cells, the most superficial of which are little more than horny scales. In the deeper layers they are less closely packed, however, and well-defined nuclei as well as intercellular spaces are comparatively common in health. The horny layer is

[1] Bowen, Anatomischer Anzeiger, iv, 1889, M. 13-14.

the thickest and most highly developed on the palms and soles. At the follicular orifices the cells are arranged in a circular manner and project into the depressions for some distance, supplying a lining for the lips and the ducts. The cells of the corneous layer are very resistant to acids, but much less so to alkalies. When treated with the latter they become swollen and vesicular, and the smooth membranous sack which constitutes their outer covering is plainly apparent.

PIGMENT.

The color of the skin is largely due to the deposits of an amorphous substance known as melanin in the cell cavities of the lower rete. The function of the pigment is mainly protective, in that it serves

Fig. 5.—Negro's skin, showing location of pigment.

to shield the underlying structures from the actinic effects of light. Its origin and chemical nature are still undecided questions. Bichat, Riehl and Ehrmann believe that it is carried up from the corium by leucocytes, Karg and Kölliker that it is due to the migration of pigmented cells from the papillary layer, Schmidt, that it is due to the breaking down of blood pigment in the connective tissues and the transportation of this material by leucocytes; and Piersol, Dyson and McDonagh, that it is the result of a metabolic process which affects the proteid molecule of the cells

in loco. Staffel and Meirowsky are of the opinion that the pigment is produced in the nuclei of both epidermis and cutis, but Dyson concludes that the pigment found in the cutis is of a more stable composition than that occurring on the rete and that it is probably epidermal pigment which has been carried into the connective tissue by the lymphatics. Chemically, melanin is an albuminous substance, containing a considerable percentage of sulphur, but no iron.

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LYMPHATICS.

The lymphatic system of the skin consists of a series of closed vessels, arranged somewhat like the blood vessels which they, in a measure, accompany. Compared to the lymphatic spaces which they drain, the vessels are comparatively few in number. The vast majority of the spaces are unlined, being little more than interstices between the cells and the connective tissue structures. The lymph passes into the lymphatic channels either through the porous cement ridges of the endothelium (stomata) or through pseudostomata in the walls (Schenck). Flemming has demonstrated the rudiments of a muscular apparatus in the larger vessels, and it is possible that this materially aids in the process of circulation. The lymph reaches the rete through a network of small channels in the apices of the papillae. Lymph spaces which are not provided with a free outlet into distinct lymphatic vessels, as the interspinous spaces in the prickle layer for example, are sometimes referred to as "juice spaces." These cavities have been injected with a solution of gold chloride and formic acid through the corial lymph spaces by Key and Retzius (cited by Unna). These investigators found the circulation to be least energetic in the interpapillary regions. The excretory ducts of the coil glands, the sebaceous glands and the prickle layer of the hair follicles have interepithelial juice spaces similar to those occurring in the rete. The oblique muscles of the skin, the coil glands and the connective tissue bundles practically float in distended lymph spaces. According to Unna, the greater part of the lymph which circulates through the skin is taken up by the veins. Physiologic experiments support this view, inasmuch as edema of the extremities always follows ligation of the veins, but only occasionally ligation of the lymphatic trunks.

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BLOOD VESSELS.

The skin is richly supplied with blood through two parallel horizontal systems of vessels, a deep or subcutaneous plexus and a superficial or subpapillary plexus. In the subcutaneous region the vessels are of large diameter, and give off numerous lateral branches which furnish an abundant blood supply to the hair follicles and the deep sebaceous and coil glands. From the superficial plexus capillary loops extend upward to the tips of the papillae. Before reaching the apex they frequently divide into two or more branches. It is very probable that these minute arterioles anastomose directly with the veins and seldom, if ever, end as terminal vessels (Sucquet). The papillae containing tactile corpuscles have generally no capillaries. The arrangement of the veins corresponds to that of the arteries; a deep and a superficial plexus being present. In those localities where the skin is most moveable both arteries and veins branch more frequently, and at sharper angles than in the regions which remain practically stationary.

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NERVES.

The nerves of the skin follow the general course of the blood vessels as a rule, but are far less in number. They are both medullated and non-medullated. The main trunks run horizontally in the subcutaneous tissues, and give off slender branches which divide and subdivide, passing upward through the corium with the arteries from the subcutaneous plexus. When the pars papillaris is reached, the nerve trunks again assume a horizontal direction, and ultimately form a true nerve plexus which supplies both the papillae and the overlying rete. Many slender branches pass directly into the papillary bodies and terminate there in special end organs, or break up into fine non-medullated fibrillae which are distributed to the endothelium of the capillaris. The vast majority, however, pass through the papillae, lose their sheaths and terminate in the cells or interspinal spaces of the prickle layer, at some point below the level of the stra-

tum granulosum. The free sensory endings are often ball- or knob-shaped (Dogiel), and Krause states that all sensitive nerve fibers terminate in minute enlargements. Merkel has described tactile cells, which are found in the deeper layers of the epidermis, and which probably represent a transitional form of intraepithelial terminations midway between the end-knob and the more specialized end-organs (Piersol).

The hair follicles receive their nerve supply in a manner similar to that of the epidermis, the fibers passing to the prickle layer of the follicle, but the medullated trunks which supply them lose their coats at the subglandular constriction and pass downward into the lower part of the follicle simply as naked filaments.

In addition to the simpler end-knobs which have been described,

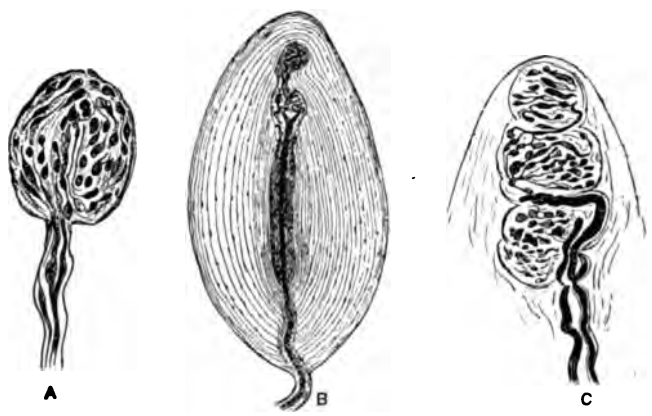

Fig. 6.—Tactile corpuscles. *A*, end bulb (Krause); *B*, corpuscle of Pacini; *C*, corpuscle of Meissner. (Cunningham's Anatomy.)

several well-known types of encapsulated nerve endings occur in man. Of these, the least complicated are the tactile corpuscles, or corpuscles of Meissner, the end-bulbs, the genital corpuscles, and the terminal cylinders. The corpuscles of Meissner are small, oval structures, from 80 to 150 microns long and about one-half as broad, which occur in great numbers in the corium on the flexor surfaces of the fingers and toes. They are also found in the integument on other sensitive regions—the lips, nipples, penis and clitoris, as well as the dorsum of the hands and feet. They generally occupy the tip of a papilla, their long axis perpendicular to the surface. Each corpuscle receives from one to four nerve fibers. The fibers usually enter at the deeper pole, lose their medullary coverings in the wall of the capsule,

and pass upward in parallel or spiral windings between the flattened tactile cells which fill the interior.

The end-bulbs are oval or irregularly spherical bodies which are found near the summits of the papillae and the corial ridges. They are most numerous on those parts of the integument which are highly endowed with sensibility. They vary from 10 to 100 microns in diameter, and consist of a thin, fibrous capsule filled with a semisolid substance in which the nerve fibrils, which have lost their medullary coverings on the capsular coats, end as a mass of fine, closely intertwined fibrils. The genital corpuscles occur only in the genital region, and present the same general structural characteristics as the end-bulbs, although they are much larger (from 0.02 to 0.35 mm. in diameter) and more intricate, and possess a somewhat thicker capsule. The terminal cylinders, or Raffini's endings, are found in the deeper layers of the corium of the fingers and toes, and consist, essentially, of a slender capsule, the coverings of which blend with the sheath of the entering nerve. After penetrating the fibrous coat of the organ, the naked axis cylinder divides and subdivides into numerous branches, which present irregular varicosities and which ultimately end in minute club-shaped expansions (Piersol). In addition to these comparatively simple end-organs, the skin contains a second group, the members of which are much larger and more complex in structure. The most representative of these is the Pacinian corpuscle, or corpuscle of Vater, which is not confined to the connective tissue of the skin but is also found in many other parts of the body. These bodies are large, oval, onion-like structures, which vary from 0.5 to 2.0 mm. in length, and possess a thick capsule, composed of from one to three dozen concentric layers of fibrous tissue, and a core of granular, semisolid material in which the naked axis cylinder is embedded. On entering the capsule the nerve trunk loses its fibrous coating (sheath of Henle) which becomes continuous with the capsular layers, but the medullary covering persists until the proximal end of the core is reached. At some point near the distal extremity of the organ the nerve filament divides into two or three branches, and these finally terminate in slightly expanded end-knobs.

The Golgi-Mazzoni corpuscles are found in the corium of the external genital organs and on the flexor surfaces of the finger tips. In many respects they resemble the Pacinian bodies, but are smaller and relatively broader.

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NERVES.—*Quain*, Elements of Anatomy, i, part 2, London, 1891. — *Piersol*, Normal Histology, 9th ed., Phila., 1910, p. 79.

MUSCLES.

The muscles of the skin are both the striated and non-striated varieties. The striated are comparatively few in number, and are most numerous in the face and neck. The non-striated are very abundant, particularly in the scrotal and perineal regions, and the scalp. The majority run in either a parallel or oblique direction to the general surface. In the areola of the nipple the horizontal fibers are arranged in a similar manner, a muscular ring being formed. In the scrotum and perineum they anastomose with each other, a perfect network of fibers resulting. The arrector muscles of the hair follicles arise from the inner root sheath, at a point just below the base of the contiguous sebaceous gland, and pass obliquely upward, to terminate in the corium. The sudden contraction of these arrectors in certain hairy regions gives rise to the condition commonly known as goose flesh (cutis anserina). Occasionally, in its course upward, a muscle divides into two or more bundles, and these branches may unite with the muscle fibers from other structures, forming a plate-like network in the corium. The cutaneous musculature is abundantly supplied with elastic fibers which serve not only to bind the fibers together but supply the tendinous attachments at the extremities as well. To quote Unna, "The real beginning and end of the oblique tensors of the skin is the elastic tissue." In consequence, the elastic framework helps to distribute traction and pressure, and this influences not only secretion, but excretion, circulation and the interchange of fluids and gases as well.

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MUSCLES.—*Robinson*, Manual of Dermatology, New York, 1884, p. 24. — *Unna*, Ziemssen's Handbook of Diseases of the Skin, New York, 1885. — *Heimann*, Jour. Cutan. Dis., 1916, p. 30, et seq.

SWEAT GLANDS.

The sweat glands, coil glands or glandulae sudoriferae, are modified tubular glands which occur in the integument on all parts of the body except the margins of the lips, the glans, and the inner surfaces of the prepuce (Robinson and Klein). They are most numerous on the palms and soles, where they average about 1,000 to the square cm.; and fewest on the back and buttocks, where they average

50 or less to the square centimeter. Sappey placed their total number at over 2,000,000, and Haerschelmann estimates it even higher than this. Anatomically, there are two distinct divisions, a body and an excretory duct. The body, which varies somewhat in size, is globular or flattened, and consists of the complicated windings of a single or rarely branched tube, having a fairly uniform caliber. The secreting, or glandular portion of the tubule is of somewhat larger diameter than the duct, and is made up of a single row of rather flat columnar epithelial cells with granular cytoplasm and large, spherical nuclei. The bases of the secreting cells rest on a thin but compact layer of involuntary muscle, the spindle-shaped elements of which are arranged longitudinally. Surrounding this layer is the membrana propria, and this is supported by an external sheath of dense fibrous and elastic tissue. Certain of the large glands (as the axillary) excrete small amounts of fatty material and pigment granules as well as fluid. According to Unna, there is a periodical presence of fat in the smaller ones as well, particularly during fetal life. This investigator believes, with Meissner, that the sole function of the coil glands is that of supplying lubrication to the skin. The glandular portion of the sweat coil is abundantly supplied with blood from a dense network of arterioles which surrounds it and penetrates between its folds. The nerves consist of non-medullated sympathetic fibers which form a close plexus on the outer surface of the membrana propria and give off fibrils to the glandular cells and muscle elements. The duct is of less diameter than the secreting portion, and is little more than a tube. The duct is lined with ordinary pavement epithelium, arranged, in two rows, on a membrana propria which in turn rests on a thick layer of connective tissue. There are no muscular fibers. The duct runs upward through the corium in a spiral or wavy manner, until it reaches the rete, generally at some point between the papillae. Here it loses its connective tissue sheath and from this point onward its course is less regular. During its progress through the rete it is surrounded only by ordinary prickle cells, but commencing with the stratum granulosum, where it again assumes a corkscrew-like course, the cells immediately surrounding it are depressed in such a manner as to convert the surface opening into a rounded, funnel-shaped aperture. The circumanal, ciliary and ceruminous glands are modified examples of coil glands. According to Huber (Piersol), there are four varieties of glands found in the circumanal region, coil glands of the usual type, coil glands of exceptional size (Gay), glands

having relatively straight ducts that terminate in expanded saccules from which secondary alveoli arise, and branched glands of the tuboalveolar type. Both the ciliary and ceruminous glands are not typical coil structures, but more nearly resemble glands of the tuboalveolar type.

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SWEAT GLANDS.—*Piersol*, loc. cit. — *Duhring*, loc. cit. — *Hacrschelmann*, Centralbl. f. Med., No. 11, 1876.

SEBACEOUS GLANDS.

The sebaceous glands, oil glands, or glandulae sebaceae, are usually, but not necessarily, associated with, or in close relation to, a hair

Fig. 7.—Hairs in an embryo. Low magnification. (Courtesy of Dr. Frederick G. Harris.)

follicle. The Meibomian glands in the eyelids are modified glands of this type, as are, also, the Tysonian glands of the penis. The sebaceous glands occur in the corium on all parts of the body except the palms, soles and terminal phalanges. The size of the gland bears no relation to that of the hair follicle to which it is connected. The

smallest glands are those of the scalp, the largest those of the mons veneris, scrotum, nose and external ear.

Anatomically, a sebaceous gland consists of a fibrous capsule, a membrana propria and a collection of epithelial elements. Both envelope and lining membrane are continuous with the corresponding layers of the hair follicle, and the epithelium is a direct prolongation from either the outer root sheath of a follicle or from the rete itself. These organs vary from small, simple, pouch-like alveoli to large, multiple lobular or racemose structures. The periphery of the alveolus is occupied by a single or double layer of columnar or cubical epithelial cells, with dark cytoplasm and round or oval nuclei. The center of the alveolus is filled with larger cuboidal or polyhedral cells which stain indistinctly and contain more or less fat. As these break down and escape from the lobules and acini, new cells are supplied by the continuous activity of the proliferating basal elements. The fatty material and epithelial débris escape into the hair follicle, or, in the case of lanugo hairs and independent glands, directly upon the surface of the skin.[1]

THE HAIR.

The hairs are cylindrical, horny structures derived from the epidermis, and are firmly implanted in pouch-like depressions in the corium. They occur on all parts of the body except the palms and soles, the penis, and the terminal phalanges of the fingers and toes. With regard to type, hairs may be separated into three classes: first, lanugo, or fine, soft hairs with minute shafts and relatively large papillae, occurring on the forehead, ears and trunk; second, long hairs, as those on the scalp, pubes, bearded region and axillae; and third, short, heavy, stiff hairs, such as are found on the eyebrows and eyelids. Anatomically, a hair consists of two divisions, the shaft or free portion, and the root, or fixed portion which is embedded in the skin. The main mass, or cortical substance, of the shaft is composed of flat, nucleated, epithelial cells which are firmly adherent to each other and which normally contain considerable amounts of pigment. It is largely to this coloring matter than the hair owes its hue. The medulla of the shaft is usually filled with embryonal corpuscles, and these also may contain more or less pigment. Air spaces are present in both cortical substance and medulla. Externally, the shaft is covered with a thin, semitransparent, shiny membrane, the cuticle,

[1] *Piersol*, loc. cit.

which is composed of flat, imbricated cells. On transverse section, straight hairs are circular or oblong, as a rule, while curly and kinky hairs are elliptical or ovoid. The hair follicle, which encloses the hair root, consists of three layers: an external, connective tissue coat, which contains an artery, a vein and nerves; a middle coat, also fibrous in structure, and supplied with an artery and vein; and an inner coat, or basement membrane, which is composed of a homogeneous substance, and has no vessels. The hair root is supplied with an

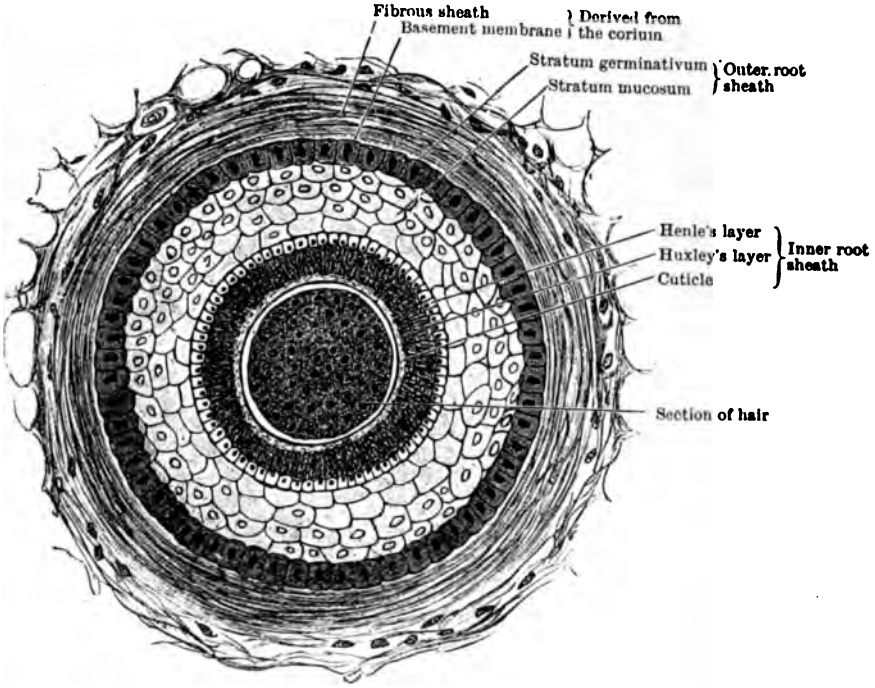

Fig. 8.—Transverse section of hair follicle with contained hair, highly magnified. Schematic. (Cunningham's Anatomy.)

external root sheath and an internal root sheath. The cells of the former are of the modified prickle type, and lie in close contact with the homogeneous lining membrane of the follicle. Near the mouth of the cavity this covering is several cells thick, but as the bottom of the follicle is reached it becomes quite thin, only one layer of cells persisting. The internal root sheath consists of three layers. The outer, or sheath of Henle, is composed of pale, polygonal epithelial cells, with granular protoplasm and indistinct nuclei. The middle, or

Huxley's layer, is also derived from the rete, and consists of from one to three strata of nucleated cuboidal cells. The third, and innermost layer, is known as the sheath cuticle. Structurally, it resembles

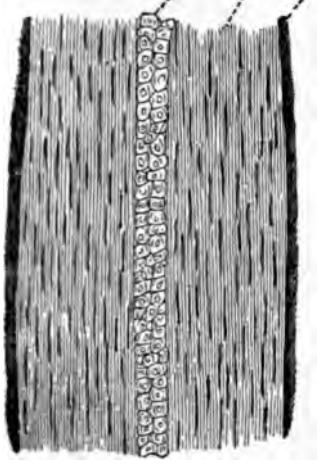

Fig. 9.—Longitudinal section of hair, X 350. *A*, medulla; *B*, cortex; *C*, cuticle. (Bailey's Histology.)

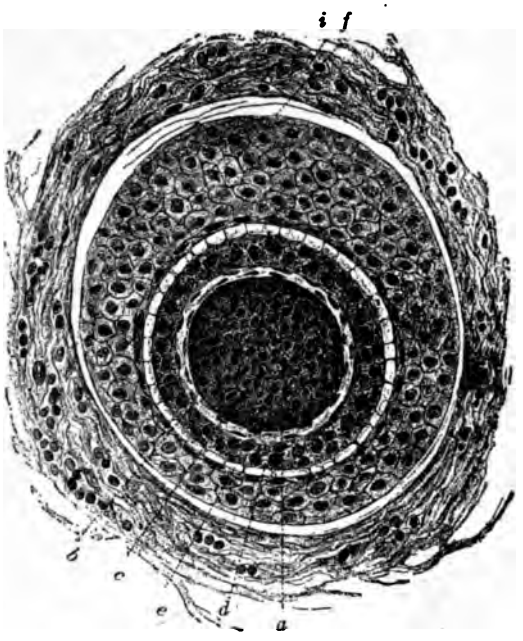

Fig. 10.—Transverse section through root of hair and hair follicle. Schematic. *a*, hair; *b*, hair cuticle; *c*, cuticle of root sheath; *d*, Huxley's layer; *e*, Henle's layer; *f*, outer root sheath; *i*, connective tissue follicle. (Bailey's Histology.)

the hair cuticle, but its constituent cells are always nucleated, and are disposed in such a manner that they dovetail into the serrations on the coat of the encompassed hair.

REFERENCES.

HAIR.—*L. Heitzmann*, loc. cit. — *Bowen*, American Text Book of Genito-Urinary Diseases, Syphilology and Diseases of the Skin, Phila., 1898. — *Piersol*, loc. cit.

THE NAILS.

The nails are flat, horny, plate-like formations which overlie the ends of the dorsal surfaces of the fingers and toes, and are composed of modified epithelial tissue. Anatomically, a nail may be divided into a body and a root, the latter being firmly embedded in the nail groove, a pocket-like recess formed by the infolding of the epidermal layer. The upper fold of the nail groove is called the nail wall. The

body, or nail plate, is composed of flattened, corneous cells and, together with its underlying rete, is supported by a corial nail-bed. Piersol divides the nail-bed into three divisions; a proximal, middle

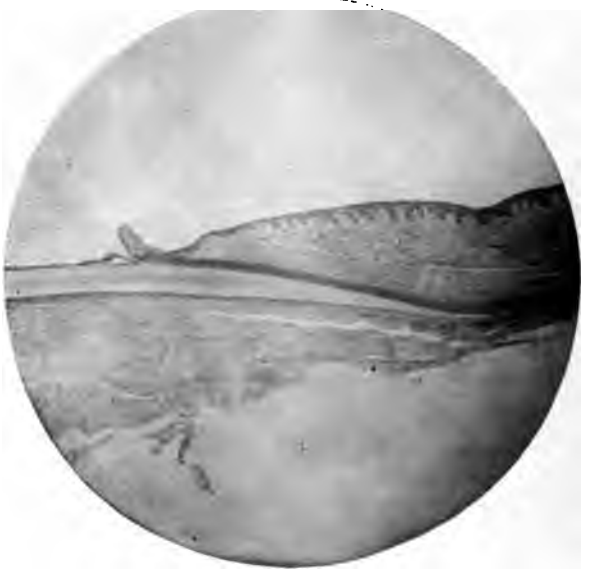

Fig. 11.—Nail and nail-bed, showing ungual fold. (Courtesy of Dr. Frederick G. Harris.)

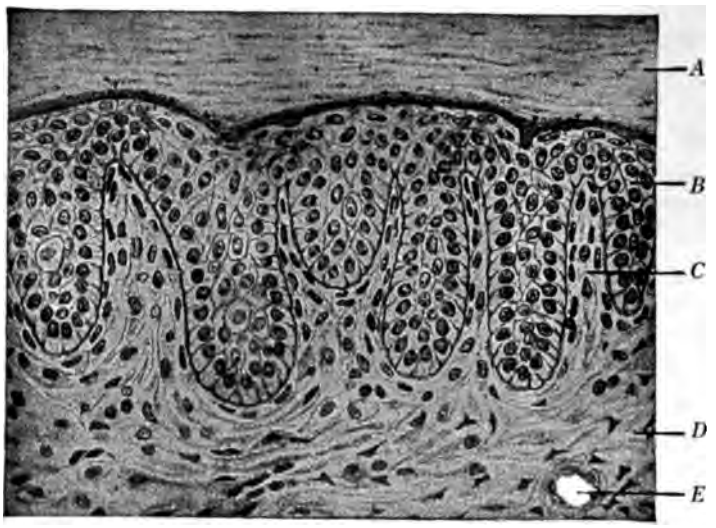

Fig. 12.—Vertical transverse section through nail body. X 280. *A*, stratum germinativum; *B*, ridge of nail-bed; *C*, ridge of nail-bed; *D*, derma; *E*, blood vessel. (Szymonowicz, in Bailey's Histology.)

and distal, each of which respectively corresponds to the white, rosy or yellow zone seen from the dorsal surface of the nail. The proximal portion, or matrix, is the most important one, inasmuch as it corresponds to the productive area of the appendage and supplies the material for replacement in case of nail loss. The character of the nail-bed varies considerably in the various localities. Near the base of the matrix the papillae are low and broad, and in its middle third

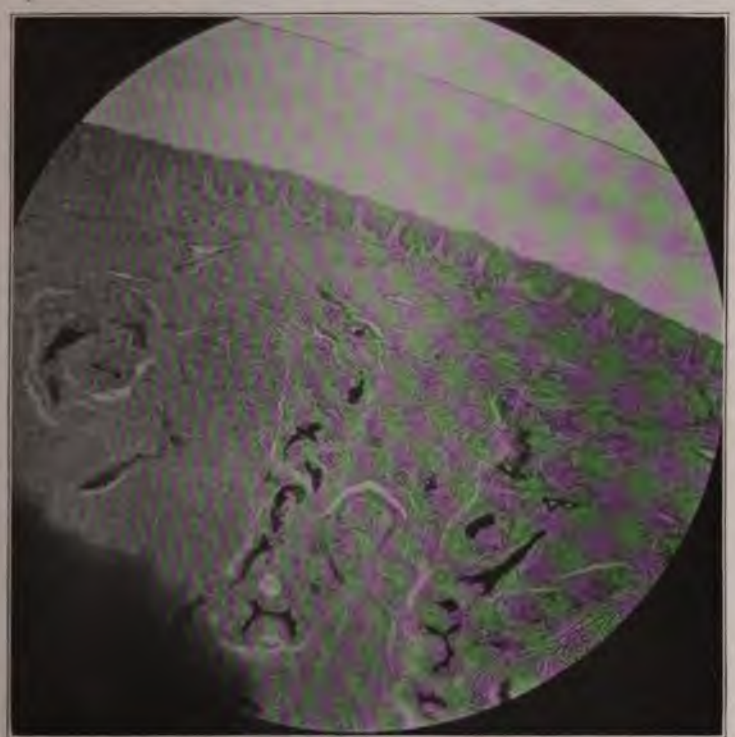

Fig. 13.—Section of finger nail, injected. (Courtesy of Dr. Frederick G. Harris.)

they totally disappear, to be succeeded at its distal third by a field of low, narrow, closely set, horizontal ridges, arranged parallel with the long axis of the nail. At the anterior margin of the lunula these are replaced by broad linear elevations which extend to the distal end of the nail-bed. The connective tissue fibers in the subungual region are arranged both vertically and horizontally. The former extend from the periosteum to the under surface of the rete, and serve to bind the nail firmly in place. White spots, or "gift spots,"

in the nail plates are due to the presence of minute collections of air in the interior of the nail substance. The rate of nail growth varies with the age and occupation of the patient and the season of the year. It is most rapid in the young and during the summer months. The

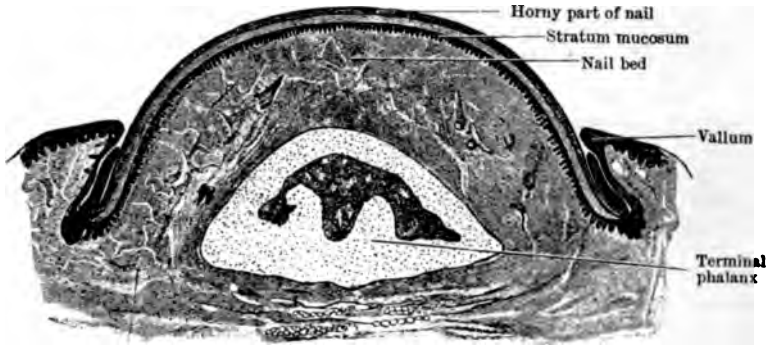

Fig. 14.—Transverse section of a nail. (Cunningham's Anatomy.)

finger nails grow faster than the toe nails, and those on the right hand faster than those on the left (Moleschott). The average growth is approximately one cm. a week (Quain). Zeisler has shown that the nails grow less rapidly on a limb that has been fractured. He attributes the sluggishness to circulatory interference.

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PHYSIOLOGY.

In addition to serving as a protective covering, the skin exercises a number of other important functions. It acts as a heat regulator and an organ of sensation and touch. It is also a medium of secretion, excretion and absorption. Its protective capacity is due to several factors. Primarily, the smooth, insensitive horny layer, with its underlying regenerative elements, is particularly adapted to resist light and heat, as well as bacterial invasion, and when combined with the tough, resistant corium, on its springy, elastic base of loose fibrous and adipose tissue, it furnishes an admirable barrier against force from without. The ever present coating of fatty matter which is supplied by the coil and sebaceous glands, helps to render the integument impervious to fluids and guards it against the action of many chemical irritants. The most vulnerable points in the unbroken skin are the pilosebaceous orifices, and it is through these openings that bacteria usually gain access.

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PHYSIOLOGY.—In the preparation of this section I am particularly indebted to the classical writings of Professor Howell, and much of the information, particularly that relating to the cutaneous nerves, was obtained directly from the most recent edition of his work on physiology. — *Howell*, Text Book of Physiology, Phila., 1913. — *Ziemssen*, loc. cit. — *Duhring*, loc. cit. — *Röhrig*, Die Physiologie der Haut, Berlin, 1876. — *Head and Rivers*, "Brain," 1905, p. 99; 1908, p. 323. — *Blix*, Zeitschr. f. Biologie, xx, p. 20. — *Donaldson*, "Mind," xxxix, p. 1. — *Head*, "Brain," 1906, p. 537. — *Baker*, Jour. Exper. Med., i, 1896, p. 348. — *Head*, "Brain," 1893, p. 1; 1901, pp. 24 and 345.

Heat Regulation.—The tension of the skin and the temperature of the body are to a considerable degree interdependent. According to Howell, heat is regularly lost from the body through the excreta, the expired air, by the evaporation of sweat from the skin, by conduction and especially by radiation of heat from the skin. Neither the corium nor the epidermis is a good conductor of heat, but an increased flow of blood through the former both lowers the tension and materially hastens heat conduction and consequent radiation. The respiratory power of the skin is insignificant as compared with that of the amphibia. Von Gerlach (cited by Röhrig) estimates the quantity of oxygen absorbed by this route as 1/137 of that passing in through the lungs, and of carbon dioxide as 1/25 to 1/92. Regnault and Reiset consider the amounts even less. The sensory nerves of the skin are

of two types which regenerate at different times after severance and may be studied separately by this means. The system of fibers which regenerates most rapidly conveys imperfectly localized sensations of pain and extreme temperatures, and serves, in a general way, as a warning or defensive agency against pathologic changes. For this reason, it is designated as the "protopathic" system. The glan penis possesses only protopathic sensibility. In the second system the fibers regenerate less rapidly and are far more sensitive, the sensations conveyed being clearly defined and sharply localized. This system of fibers is found only in the skin, and includes separate fibers for heat, for cold, for light pressures and for tactile discrimination. It is known as the "epicritic" system. Briefly, the functions of these two systems may be tabulated as follows:

Cutaneous sensory fibers	Protopathic	Heat (extremes only). Cold (extremes only). Pain.
	Epicritic	Heat (slight differences). Cold (slight differences). Touch (light pressures). Tactile discrimination.

The cutaneous senses of heat and cold, as well as of pressure and pain are distributed over the skin in a punctiform manner, as originally demonstrated by Blix and by Donaldson (cited by Howell), working independently. The evidence at present available indicates that each cutaneous nerve has its own nerve fibers capable of giving or conveying only its own particular quality of sensation. The most sensitive areas to heat and cold are found on the tip of the tongue, the eyelids, the cheeks and the lips. The pressure points are smaller and more numerous than the hot and cold points. On the non-hairy parts the sensitiveness of these spots is probably entirely dependent upon the presence of the tactile or Meissner corpuscles in the papillae. In the hairy regions the pressure points lie directly over or in close proximity to the hair follicles (Van Frey, cited by Howell). This is due to the fact that the pressure nerve fibers terminate in a ring which encompasses the follicle, the latter thus serving as a sort of end-organ, which, because of its attachment to the end of the lever-like shaft, is constantly placed in a somewhat precarious position.

Localization.—The delicacy of the pressure sense may be determined by the minimum distance that separates two recognizable points, a pair of Weber's compasses or an esthesiometer being employed for

the purpose, or the so-called "threshold stimulus" (the minimum pressure necessary to arouse a sensation) standard may be used. By the old two-point method, the tip of the tongue (1.1 mm.) and the palmar surface of the finger tip (2.3 mm.) were the most sensitive areas, while the lower spinal region (54. mm.) and the sternum (45. mm.) were the least sensitive. As determined by the threshold stimulus, the face and the temples are the most sensitive regions of the body.

The Pain Sense.—Pain sense, like that of temperature and pressure, has a punctiform distribution, and is probably the most widely disseminated of all. The stimulus probably affects only the free endings of certain nerve fibers. The majority of observers agree that these fibers have a specific energy for pain, and serve no other purpose. The threshold stimulus for pain is commonly higher than for pressure points, but it may be lower, as on the cornea.

Localization or Projection of Pain Sensations.—Pain at surface points can usually be accurately localized, provided the senses of pressure and of temperature are retained. On the other hand, pain arising in an internal organ can seldom be accurately located, in fact it may be misreferred, as a "reflected" pain, to some distant point on the skin. That this peculiar relationship is more or less definite has been shown by Head and others. The apparent phenomenon is probably due to the close central association of parts which vary greatly in sensibility. To quote Head, "When a painful stimulus is applied to a part of low sensibility in close central connection with a part of much greater sensibility, the pain produced is felt in the part of higher sensibility rather than in the part of lower sensibility to which the stimulus was actually applied."

Absorption by the Skin.—Despite its comparative imperviousness to certain agents, the skin possesses the power of absorption to a considerable degree. The presence of excessive amounts of sebum and other fatty matter on the surface retards absorption, as Parisot and Bremond have shown, and particularly is this true when the agent is applied in a watery menstruum. Abrasions and excoriations, even though slight, greatly increase the absorptive capacity. Von Wittich believes that the stratum lucidum contains intercommunicating channels which have some connection with the corial juice spaces, but he has never been able to verify his theory. Von Ziemssen states that water is never absorbed by the uninjured skin, and cites the negative results obtained by Braune with iodine and by Fleischer

with water, but the medicated bath experiments of both Keller and Bremond disprove this conclusion. Bremond found that absorption was most rapid if the solution was above blood heat (100.4° F.) Röhrig applied aqueous solutions of various substances to the skin by means of a spray apparatus, and found that iodine appeared in the urine and saliva in twenty minutes and potassium ferrocyanide in from one to two hours. Von Wittich and Ziemssen repeated Röhrig's experiments, but were unable to verify his findings. Our first practical knowledge of the cutaneous absorption of drugs suspended in oil and fats was probably derived from the administration of mercury by this route. Fleischer and Rindfleisch believed that the particles of mercury passed through the epidermis, and Voit found globules of the metal between the layers of the epidermis and in the cutis, but Neumann and others held that the drug entered through the hair follicles and sebaceous glands. Lassar, basing his conclusions on the results of animal experimentation, stated that fats and substances dissolved in them penetrated the skin to an unlimited extent and that absorption probably occurred through the follicular openings. Wasmuth (cited by L. Heitzmann), found that bacteria commonly gain entrance through these orifices. My own studies, undertaken under the direction of Professor Unna, in 1906, indicate that the views of Neumann and Lassar are the correct ones. Fifty different agents and mixtures, ranging from alcohol, ether and benzine to lanolin and ichthyol, were tried. For purposes of identification, a small percentage of fuchsin or Sudan iii was first added to the drug to be tested. The mixture was then applied to the normal, clipped or shaved skin of a guinea-pig or rabbit, and allowed to remain for periods varying from fifteen minutes to five hours. Massage was employed in some instances. The final step consisted in excising a small piece of the skin thus treated, and sectioning it in a freezing microtome. The specimens were mounted in liquid honey, which rendered them transparent, but did not affect the aniline dye. Goose grease was found to penetrate most readily, while lanolin, for which such superior penetrative power has been claimed, was absorbed very slowly, if at all. The substances invariably entered at the sebaceous and follicular openings, and were taken up by the appended glands. Only the more superficial layers of the corneum exhibited any trace whatever of their presence.

It is hardly probable that substances in a dry state are ever taken into the system through the skin. The results in Voubard's sulphur

experiments were probably due to the absorption of the sulphurous acid gas. Röhrig's work with hydrogen sulphide on rabbits, would indicate that the skin absorbs some varieties of gas with avidity.

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Sweat Secretion.—The elaboration and excretion of sweat, or perspiration, is one of the most important functions of the skin. The amount normally excreted in twenty-four hours averages from 700 to 900 gms., although it may be greatly increased or decreased under certain conditions. When the amount is comparatively slight and evaporation occurs as soon as the surface is reached, the process is termed insensible perspiration; when it is excreted with sufficient rapidity to form drops of moisture on the surface, it is spoken of as sensible perspiration. Normally, sweat is a watery or fatty, clear fluid, with a low specific gravity (1.004), and an alkaline reaction. From admixture with sebum or fatty acids (generally decomposition products), it may become acid. Microscopically, it contains a few epithelial cells and some fine fatty granules. The principal inorganic constituent is sodium chloride, with slight traces of the alkaline sulphates and phosphates. The organic bodies are represented by urea (which is markedly increased in amount following violent exercise or the use of vapor baths), uric acid, creatinin, aromatic oxyacids, ethereal sulphates of phenol and skatol, oxyaminoproprionic acid, and albumin, all in exceedingly minute amounts. The existence of special secretory nerve fibers to the coil glands was first demonstrated by Goltz, in 1875, and the subject has been exhaustively investigated by Langley, Arnstein and others (cited by Howell), but the special sweat centers in the central nervous system have yet to be definitely located.

Sebaceous Secretion.—The sebaceous secretion, or sebum, is an oily, yellowish semifluid substance of variable consistence, which forms cheesy masses when exposed in bulk to the air. On the so-called "seborrheic areas" (the nose and flush areas of the cheeks, the forehead, the sternal and interscapular regions) it commonly forms a thin, oily coating on the surface. In the sebaceous orifices it becomes mixed with dirt and other foreign matter, frequently including micrococci, as well as a small acarus, the demodex follicularis,

and forms small, round, tallow-like plugs (comedones). It accumulates in considerable quantities on the skin of the fetus, and in the newborn is called vernix caseosa. On the prepuce it becomes mixed with the fragments of exfoliated and macerated epidermis, and is known as smegma. In the external auditory meatus it mingles with the discharge from the adjacent coil glands, and forms earwax or cerumen. Its exact chemical composition is not known. In addition to remnants of epithelium and some inorganic salts, it contains fats, soaps and a trace of cholesterin. The chief function of the sebum is to lubricate and protect the skin and hair. Physiologically, it is a true secretion, and the sebaceous glands, like the coil glands, are probably supplied with special centers in the central nervous system. Duhring believes that the sebaceous and coil glands have much in common, and that they act more or less in concert, both in health and disease. Clinically, hyperidrosis and seborrhea frequently occur together in the same individual, but the existence of a closer relationship is yet to be proved.

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GENERAL ETIOLOGY AND PATHOLOGY.

From its position the skin is exposed to more forms of irritation than any other organ. The changes that take place in it as a result of disease follow essentially the same laws as those occurring in other parts of the body. According to Pusey, the health of the skin may be affected by: (a) causes which act directly upon the cells of the skin; (b) causes which affect the supply or composition of the blood or lymph, and (c) causes which influence the cutaneous nerve elements. In the majority of instances it is impossible to draw a sharp line of demarcation between the symptomatic disorders of the skin, conditions in which the cutaneous lesions are but secondary manifestations of some derangement of the internal economy, and the idiopathic dermatoses, diseases which originate in the skin itself and confine their action to this organ alone. Consequently, a thorough knowledge of general medicine, and particularly of general pathology, is indispensable to the scientific practice of dermatology.

The causes of disease may be classified, according to their character and intensity, as predisposing and exciting. Under the former may be placed those conditions which, for any reason, lower the resistance of the skin of an individual or in any way increase its susceptibility to attack. The most generally recognized predisposing factors may be classified as follows:

Age.—Some diseases of the skin usually, or invariably, develop only at certain periods of life, while others may appear at any time. Thus ichthyosis, nævi, epidermidolysis bullosa, and congenital syphilis occur in infancy. Principally because of the frequency of dietetic indiscretions in early life, children are particularly susceptible to cutaneous diseases of gastrointestinal origin, as urticaria and the erythemata. Owing to the tender and delicate nature of their skins, as well as the almost constant exposure to trauma, children are also particularly susceptible to the parasitic diseases, such as impetigo contagiosa, tinea and favus. Acne vulgaris and psoriasis are diseases of early adult life. Pruritus, carcinoma and sarcoma are diseases of adult or old age.

Diathesis.—The terms "diathesis" and "temperament" have

grown less popular as our knowledge of medicine and our desire for scientific accuracy have advanced. Hutchinson has defined diathesis as "any condition of prolonged peculiarity of health giving proclivity to definite forms of disease," while Halle (cited by Duhring) states that "diatheses signify such hereditary and innate constitutional conditions as may lead to the outbreak of some local or general disease peculiar to the diathesis." The latter view was evidently the one generally accepted by the members of the older French school, and while the theory is probably applicable in many instances it has been sadly overworked in others. The expression is now seldom employed, and the abandonment of its use marks a milestone in the advancement of science.

Sex.—Sex is apparently an important factor in the etiology of many cutaneous disorders. Lupus erythematosus, chloasma, Paget's disease, and impetigo herpetiformis occur oftenest in women, while epithelioma, seborrheic keratosis, carbunculosis, and the occupational dermatoses are more frequent in men.

Race—Nationality.—The tendency of the negro to keloid and elephantiasis is well known, and myoma and fibroid of the uterus are comparatively common in females of this race. Dermatoses of nervous origin are commonest in individuals of Jewish extraction. Some disorders, as pellagra, elephantiasis, mycetoma, pinta, frambesia, and Aleppo boil are almost entirely restricted to the tropical and subtropical countries; while leprosy, although generally considered an affection of warm climates, is occasionally encountered in the northern countries (Sweden, Norway and Iceland), as well. Prurigo and rhinoscleroma are common in Austria and rare in America, while blastomycosis and sporotrichosis are dermatological curiosities in Prussia, but not at all unusual in the Mississippi River basin.

Seasons.—The influence of the seasons on some dermatoses is a matter of common knowledge. Prickly heat, pruritus æstivalis, and the superficial staphylococcic infections are usually diseases of the summer months. Pruritus hiemalis is a cold weather disease *per se*, and ichthyosis, like psoriasis, eczema and similar scaly inflammatory disorders, is generally more troublesome in winter. As a result of the influence it exerts on living conditions, the winter season is also indirectly responsible for the dissemination of certain of the infectious and contagious diseases, such as scabies, pediculosis, and smallpox.

Occupation.—Occupation exerts a very important influence in the etiology of diseases of the skin. Numerous irritants are employed in both household work and in the various trades, and so frequently do these various substances give rise to cutaneous inflammation that the group of "occupation dermatoses" is a large one. The subject has recently been exhaustively studied by Knowles. Houseworkers are prone to dermatitis and eczema of the hands as a result of the prolonged and excessive use of hard water and strongly alkaline soaps, as well as soda, naphthol and polishing materials. "Photographers' eczema" is due to the action of certain drugs, particularly metol, employed in developing. Woodworkers are frequently subjects of dermatitis, satinwood, cocobolo, teak and cedar wood all being capable of causing trouble at times. The constant exposure of many of these workmen to the action of methyl alcohol, benzine, turpentine and creosote is probably also a supplementary causative factor. Electrotypers, stereotypers, and foundrymen occasionally contract eczema of the hands as a result of the nature of their work. Mill-workers, particularly flax spinners, often develop erythematous and vesicular eruptions on their hands. The lactic and butyric acids which are used in the cleansing solutions in flax mills probably play as important a part in the causation as the fiber itself. Calcium chloride, copper sulphate and other chemicals employed in bleaching and cleaning are sometimes productive of dermatitis, and the hydrochloric acid and potassium bichromate solutions used in tanning leather frequently affect the workers disastrously. The list of substances that may have a deleterious effect on the skin is almost endless: oils, greases, gasoline, benzine, lye, shellac, the various aniline dyes, aurantia, pastes, glue, nicotine, the arsenic salts, mercury, sour beer, soot, and certain varieties of plants all are occasionally responsible for some form of skin irritation.

Coexisting Organic and Constitutional Diseases.—In some instances the development of a cutaneous disorder is largely dependent upon the coexistence of a preceding organic or constitutional disease. While the influence of the supposedly uric acid states (lithemia, gout, rheumatism, and allied conditions) has in my opinion been grossly exaggerated, these conditions undoubtedly appear to have some influence on the occurrence or persistence of cutaneous lesions at times. It is more probable, however, that certain types of rheumatism and of purpura and erythema nodosum are due to the same, or a closely related, microorganism. Tuberculosis, scrofuloderma, and the tuberculides

are frequently closely associated, as might be expected, and the etiologic relationship of diabetes mellitus to xanthoma diabeticorum, and to certain types of eczema, pruritus, furunculosis and carbunculosis is a matter of common observation. Other organic and functional renal disorders, as acute and chronic nephritis and oxaluria, occasionally give rise to cutaneous manifestations. Sherwell, Winfield, and others have called attention to the possible influence of urethral irritation in the male as a causative factor in acne vulgaris and erythema multiforme. The association of menstruation with outbreaks of herpes, acne and eczema has been emphasized by Bulkley.

Focal Infections.—Recently, Rosenow, Billings, Lain, Duke, Chipman, and others have called attention to the extremely important part played by focal infections of certain organs, particularly the teeth, tonsils, prostate, and the maxillary sinuses, in the causation of various systemic, as well as cutaneous, maladies. The offending agent is usually the Streptococcus viridans. It acts both directly, through its toxins, and indirectly, by sensitizing the tissues through its rôle of foreign proteid (see Anaphylaxis). While the subject is still a controversial one, the results of my own experience and investigations have convinced me that it is one worthy of careful study and consideration.

Exciting Causes.

The exciting causes in diseases of the skin may be internal (constitutional), external (local), or both. Unfortunately, pathologic processes are not mathematical in character, and in many instances it is difficult or impossible to accurately define or locate the exact etiologic factor. The following classification is a modified form of the ones suggested by Darier and by Pusey:

- Internal Causes
  - Toxic
    - Chemical agents of various kinds.
    - Foods and other proteid substances which are capable of causing anaphylaxis or allergy.
    - Other bacterial products.
  - Nervous
    - Peripheral or central lesions of the nervous system.
    - Reflex nervous disturbances.
    - Neuroses.
    - Emotional disturbances.

Toxic substances may affect the skin directly, through the blood, or indirectly, through the cutaneous nerve fibers. The two modes of action can be readily demonstrated by the use of certain common

drugs. If bromide or iodide are taken in excess they are excreted, partially at least, through the skin, and cutaneous lesions develop as a result of direct irritation. Opium and the salts of cinchona are excellent examples of the second type. Pruritus and tingling of the skin frequently follow the internal use of the former, while the ingestion of quinine often gives rise to vasomotor cutaneous phenomena.

Foods and Other Proteid Substances which are Capable of Causing Anaphylaxis or Allergy.—Few problems in medicine have attracted more attention in recent years than the subject of anaphylaxis. Regarded at first as an interesting laboratory phenomenon, subsequent investigation has shown that it plays an important part in both the therapy and etiology of numerous diseases.

As early as 1791 Jenner, in his classic work on vaccination, described certain phenomena which we now know were definite anaphylactic reactions. Magendie, in 1839, observed that dogs which had been injected with a foreign serum developed a peculiar form of illness, which often resulted fatally, if they were reinjected within a period of ten or twelve days. More than fifty years later, Flexner noted similar changes in rabbits that had been treated with horse serum. It is principally to the work of Richet and von Pirquet, however, that we owe our earlier knowledge of this now well recognized condition.

Richet's work was done with an extract obtained from the tentacles of the sea anemone which was injected into dogs, while the observations of von Pirquet (collaborating with Schick) were based on the effect of repeated injections of antistreptococcic serum (horse) in patients suffering from scarlet fever. Von Pirquet and Schick found that an animal injected with a foreign serum reacted to a second injection in a manner very different from the first, and showed that in order to obtain this changed reaction a definite period must have elapsed between the first and second injections. They called attention to the fact that this period of 8-13 days corresponded closely with the incubation period of certain of the infectious disorders. For this alteration in reaction ability, they suggested the term "allergy."

More recently, Rosenau and Anderson, in this country, have shown that animals can be sensitized not only to horse serum, but to a great variety of other foreign proteids, such as egg albumin, hemoglobin, milk, oatmeal, extract of peas, and yeast, as well as to bacterial pro-

teids, including those of the colon, anthrax, tubercle, and typhoid bacillus. They have also demonstrated that a certain degree of susceptibility can be transmitted by a female guinea-pig to her offspring.

The term anaphylaxis was suggested by Richet, who saw in the phenomenon of sensitization a process of rendering the organism more susceptible, as opposed to prophylaxis. The result of more recent observations would indicate, however, that Richet's interpretation is incorrect and that the term anaphylaxis is inappropriate inasmuch as the phenomenon is clearly bound up with actual immunity. Vaughan found that egg-albumin and other proteids, including many of bacterial origin, can be split up chemically into poisonous and non-poisonous portions, and he holds that proteid immunity and proteid susceptibility are one and the same process. Death in infectious diseases is due to the body ferments splitting up the bacterial proteids and setting free their toxic portions. Immunity, then, apparently consists in an increased production of active ferments which are capable of splitting up the invading bacterial proteids as soon as they are introduced into the body, and before they have had time to increase to such an extent that their toxic portion will cause much damage when released.

The practical application of anaphylaxis is best shown in the field of diagnosis. Tuberculosis, glanders, gonorrhea, syphilis, leprosy, ringworm, and a number of other disorders have been found to exhibit a specific reaction to extracts of their causative organisms. The result of the investigations of von Pirquet, Major and Nobel would indicate that anaphylaxis plays an important part in the skin eruptions of various of the acute exanthemata. Von Pirquet is of the opinion that the prodromal stage corresponds roughly in time with the development of the anaphylactic reaction, and that the eruptive stage is produced by the combination of the antibody with the virus of the disease, probably in the blood stream. He emphasizes the fact that the eruption commonly first appears, and later becomes more intense, in the richly vascular areas.

A great variety of diseases formerly classed as food intoxications or as idiosyncrasies to certain foods are undoubtedly due to this phenomenon. The conclusions reached by Müller, Longcope, Vaughan and other investigators indicate that serious disturbances of metabolism may develop as a result of anaphylaxis. Major found that animals which had been repeatedly exposed to anaphylactic shock showed tremendous variations from the normal in nitrogen ex-

cretion, and developed cachexia, with marked loss of weight. Even though reinjected animals exhibited no anaphylactic symptoms, the disturbances in metabolism were always present. He has suggested that the long continued ingestion of certain proteids may occasionally result in serious injury to a patient's health; even though no recognizable anaphylactic symptoms are produced.

Anstruther Davidson has called attention to the deleterious action of many varieties of fruit, and particularly oranges, when eaten in the fresh, uncooked state. Oranges exhibit their poisonous qualities most intensely when eaten fresh from the tree. When cold stored for a few weeks, they lose their poisonous qualities and may then be eaten with impunity.

Antianaphylaxis is a protective state which can be induced by the employment of small, closely repeated doses, following the initial injection of an offending proteid. If an animal is thus treated every two or three days after the first dose is administered, no shock results. Anaphylaxis appears later, however, often in an exaggerated form. Antianaphylaxis can be explained on the assumption that the closely repeated injections use up all the antibodies. Clinically, the establishment of an antianaphylactic state is still in the experimental stage, and its employment as a therapeutic measure is not to be advised. A much better plan is to discover the offending proteid, if possible, and protect the patient from it.

Other Bacterial Products.—Under this heading may be included both toxins and antitoxins. Our knowledge of bacterial products is still almost in its infancy. While few of us are willing to accept the somewhat radical theories of Sir Arbuthnot Lane, still fewer of us but will acknowledge the enormous influence that certain disturbances of the alimentary tract occasionally have on the cutaneous mechanism. That these disturbances are bacterial in origin there can be little doubt, even though our knowledge is still so deficient that in discussing them we can safely deal only in generalities. Examples of eruptions due to specific toxins are comparatively common, and those due to the action of foreign sera are also matters of almost daily observation.

Nervous Causes.—Our knowledge of the part played by the nervous system in the causation of various dermatoses has advanced greatly during the past fifty years. Much of the pioneer work along these lines we owe to S. Weir Mitchell, and to his early associates, Morehouse and Keene, in this country, to Paget and Crocker in England, Mayer and Leloir in France, and Schwimmer in Germany.

It is probable that the nervous system is a contributory factor in the etiology of a number of dermatoses. In some of these, such as hyperidrosis, glossy skin, and pruritus, a direct relationship can be traced, while in others, as alopecia areata and scleroderma, the evidence is somewhat hypothetical, though based on sound clinical reasoning.

Reede believes that the vegetative nervous system frequently plays an important rôle in the causation of diseases of the skin.

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GENERAL SYMPTOMATOLOGY.

In cutaneous medicine the symptomatology is mainly objective in character. Brocq has likened its study to that of macroscopic pathological anatomy. Although apparently intricate and complex, and at times even bizarre, the innumerable clinical manifestations are, after all, but varying composite pictures resulting from the conjoint development of various elementary lesions. These essential primary eruptive elements, as Besnier terms them, are relatively few in number and simple in configuration. As a result of the continued action of the pathological process or of trauma primary lesions may undergo various changes, and be transformed into what are known as consecutive, or secondary, lesions. There are a few lesions (such as cutaneous horns, itch mite burrows, and certain types of verrucæ), which cannot be classified under either of these headings; but these exceptions are so limited in number that they may safely be ignored. The primary elementary lesions are macules, papules, tubercles, wheals, tumors, vesicles, and blebs.

PRIMARY LESIONS.

Macules.—A macule is a circumscribed discoloration of the skin which is neither elevated nor depressed. Macules are the commonest of elementary lesions, and vary greatly in size, color, outline, distribution and etiology. They may or may not be associated with pruritus. The smallest, such as minute freckles, are so tiny as to be scarcely perceptible to the naked eye, while the larger ones may be several square centimeters in extent. A very large macule is generally referred to as a discoloration. The color depends mainly upon the nature of the parent disease, and varies from a dead white or yellowish-white to dark red or even black. Occasionally, as in purpura, the lesions are at first bright red in color, but as disintegration and absorption occur they gradually fade to a yellowish or yellowish-green tint. In macules of artificial origin, such as tattoo marks, the color varies with the nature of the pigment employed. Macular lesions are usually rounded or oval in outline, but in some instances their contour is quite irregular. They may be sharply and distinctly, or only dimly

defined. Occasionally there is a tendency to slight elevation. When this occurs the qualifying descriptive term "maculopapular" is employed. The distribution is almost entirely dependent upon the causation. Macules may result from any one of a large number of causes. Small protective pigmentary deposits in the rete, as ephelides or freckles, probably constitute the most frequent examples. Hyperemic macules also are common, and long continued and sharply localized inflammatory processes are often responsible for more or less pigmentation and staining, a result of deposition in the tissues of coloring matter from the blood.

Papules.—Papules are small, variously shaped, circumscribed, solid elevations. They differ considerably in consistency and structure as well as in etiology. The commonest papular lesions are those of the inflammatory or plastic type, such as are found in certain forms of eczema. Papules are pinpoint- to pinhead-sized, with circular or oval or angular bases, and flat, slightly depressed, pointed or conical tops. In acne and similar disorders, the elevations result from obstruction of the sebaceous canals, and are broad at the base, with blunt or rounded apices. The papules of lichen planus are polygonal in shape, with burnished, flattened or slightly umbilicated tops. In certain of the follicular disorders, the lesions develop as a result of hypercornification at the mouths of the ducts, and the resulting papules lack the smooth, polished surfaces seen in eczema and acne lesions, and are sharply conical, rough, harsh and nutmeg-grater-like. The duration of papules varies with the nature of the parent disease. Those of the inflammatory type may become vesicular or even pustular, before regression takes place. At some stage of the process they are generally scaly or crusted. When this occurs they are spoken of as "squamous" papules.

Tubercles.—Tubercles are rounded or irregularly shaped, bean- to pea-sized, solid, circumscribed, deep-seated elevations of the skin. In structure tubercles bear a considerable resemblance to papules, in fact they have been defined as "deeply seated, hypertrophic papules." Ordinarily of firm consistence, they are pinkish to dark red in color, frequently neoplastic in origin, and structurally in intimate relationship to the corial and subcutaneous tissues. Histopathologically, tubercles are characteristic of certain chronic disorders of the skin; new growths, frequently specific in nature, such as syphilis, leprosy, carcinoma and tuberculosis. As employed in dermatology, the term tubercle refers solely to lesions of a certain form and type, and implies no relationship whatever to tuberculosis. The use of the adjec-

tive "tubercular," a word formerly employed indiscriminately, is gradually becoming restricted, and the term "tuberculous" is employed whenever reference is made to any process due to the action of the tubercle bacillus.

Wheals.—Wheals are variously sized, rounded, elongated or irregularly shaped, edematous, transitory elevations of the skin. They vary in size from that of a pinhead to that of the palm or larger, the more extensive lesions resulting from the confluence of a number of smaller ones. Wheals are usually oval in outline, whitish, pinkish or reddish in color, and intensely itchy, with more or less burning. Individual lesions are generally short-lived, often existing only a few minutes. They usually appear rapidly, and disappear somewhat more slowly than they came. Wheals develop in the upper regions of the corium, and are due to a vasomotor disturbance which is characterized by a sudden peripheral hyperemia followed by immediate capillary contraction. This spasmodic constriction of the vessels forces the serum, sometimes accompanied by red cells, into the perivascular spaces, and gives rise to the typical lesions just described. Their duration is dependent upon the relaxation of the affected vessels and the subsequent absorption of the serous exudate. Wheals may result from a number of causes, both internal and external. The commonest disease characterized by their presence is *urticaria ab ingestia,* although typical lesions frequently develop following insect bites, or contact with certain plants (such as the nettle).

Tumors.—Tumors are soft or firm, pea- to egg-sized or larger, variously-shaped elevations which originate in the corial or subcutaneous tissues. The term is one commonly applied to all new growths of the skin. Tumors vary greatly in size, shape, color and consistence. They are usually semiglobular in shape, with the rounded surface directed outward, toward the point of least resistance. In some instances they are distinctly pedunculated (fibroma). The color varies with the proximity of the growth to the surface, and the presence or absence of inflammation. The overlying skin may become thinned, shiny and atrophic (as in lipoma and sebaceous cyst), or it may break down and excoriate (as in carcinoma and granuloma fungoides). The consistence is largely dependent upon the nature of the lesion, as are also the subjective symptoms.

Vesicles.—Vesicles are circumscribed, pinpoint- to pea-sized elevations of the epidermis containing free serous fluid. Vesicles differ in color, shape, anatomical location, and the nature of their contents.

They may be whitish, yellowish or reddish, according to whether they contain sweat, serum, seropurulent matter or serum mixed with blood. Their shape is to some extent dependent upon tension, and upon location. The apex may be acuminate, rounded or even umbilicated. The walls are sometimes thick and tough, as in some cases of dermatitis herpetiformis, or they may be thin and easily torn, as in herpes progenitalis. Anatomically, they may be superficial, involving only the stratum corneum, as in infectious eczematoid dermatitis, or deep, involving both rete and horny layer, as in dermatitis repens. According to Duhring, vesicles may be produced by either inflammation or by direct nerve influence. As a rule, vesicles retain their identity for only a short time, a few days at the longest. They may rupture, dry up and form crusts, become absorbed, develop into pustules or blebs, or coalesce and undermine the corneous layer.

Blebs.—Blebs, or bullae, differ from vesicles only in size. They are usually rounded or oval in outline, and may contain serum, pus or blood. In diameter they vary from that of a pea to that of a goose egg. In some diseases, as pemphigus foliaceus, the lesions seldom become distended with fluid, and the walls are thin and rupture readily, but this is the exception rather than the rule. The younger bullae are usually tense and distended, and do not become flaccid for several days after reaching maturity. Anatomically, blebs may develop at the junction of the corneous and prickle strata, in the prickle layer, or between the rete and the papillary layer (as in lichen planus bullosus). They follow essentially the same course as vesicles.

Pustules.—Pustules are vesicles containing pus. They may originate as pustules, or develop from papules or vesicles. In either of the last two contingencies, there are usually recognizable transitory stages in which the lesions are known as "papulopustules" and "vesicopustules," respectively. Pustules may be uni- or multilocular, and are acuminate, round or flat topped, or umbilicated. As a rule, they have reddened inflammatory areolae, and are accompanied by slight sensations of tension, burning and itching. They are commonly yellow in color, but if they contain blood as well as pus, they have a dull, reddish tint. Anatomically, the most frequent location for a pustule is in a hair follicle, or in an independent sebaceous gland. The duration of a pustule is variable, but always somewhat brief. The lesions may break, and drain of their own accord, or they may desiccate without rupture. The resulting cicatrization is dependent upon the extent of tissue destruction, and also, to a certain degree, upon the in-

dividual attacked. As a rule, the amount of scarring is not great, but in a few conditions, as acne vulgaris and variola, it may be quite extensive.

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SECONDARY LESIONS.

Excoriations.—Excoriations are abrasions of the skin, usually superficial in character and traumatic in origin. Their size and configuration are largely dependent upon the method of their production. Usually they result from scratching, and consequently they are of frequent occurrence in pruriginous dermatoses. Commonly they involve only the corneous and prickle layers, and there is no resultant scarring. In itchy papular disorders the excoriations may be punctate, crusted and arranged lineally, while in generalized pruritic disorders the distribution is more or less streaky. In all types of excoriations the raw, abraded surfaces, covered with exuding serum and blood, furnish excellent culture media for bacteria, and infection with the common pus producing organisms is of frequent occurrence.

Fissures.—Fissures are linear solutions of continuity of the skin due to injury or disease. Fissures commonly occur in the natural furrows or folds of the skin, as about the corners of the mouth, the palms, soles, phalangeal flexures, and in the anal region. They are usually a result of impaired nutrition or flexibility, and are comparatively frequent in ichthyosis, psoriasis, and chronic eczema. They vary considerably in length, width and depth. They are generally sharply defined, with abrupt walls, and reddened, inflamed bases. The majority of fissures are exceedingly sensitive to pressure or manipulation, and in consequence their presence is liable to interfere considerably with the mobility of the part involved.

Scales.—Scales are dry or greasy, laminated masses of exfoliated epidermis. The body is constantly undergoing a certain degree of desquamation, the corneous material being thrown off in the form of small, branny particles. Scales vary in size from these minute, furfuraceous fragments up to large sheets of horny epidermis, such as are seen in the later stages of scarlet fever. In the majority of instances they are thin, dry, harsh and brittle, but occasionally, as in seborrheic dermatitis, they are unctuous, greasy and smooth to the touch. In some diseases, as psoriasis and dermatitis exfoliativa,

scales are formed and thrown off in large quantities. In the more acute inflammatory dermatoses scaling is usually a less conspicuous feature, but is always present at some period in the course of the disease.

Crusts.—Crusts are irregularly shaped dried masses of serous exudate, usually mixed with pus, blood and epithelial débris. They vary greatly in appearance, according to their composition and origin. They may be yellowish, thin and friable, with upturned edges, as in impetigo contagiosa and in some cases of eczema, or yellowish, flat, greasy and adherent, as in seborrheic dermatitis. In some of the mycotic disorders (favus) they are sulphur colored, disc-like and friable, and in ecthyma, thick, hard and brownish, with some associated surface ulceration; while in certain stages of syphilis, and occasionally in bromoderma, they are elevated, oyster-shell-like masses, brownish, blackish or greenish in color and often with ulcerated bases.

Ulcerations.—Ulcerations, or ulcers, are irregularly sized and shaped excavations of the integument due to injury or disease. They vary widely in shape, size and origin. In outline they are usually round, oval, reniform or serpiginous. They occur as a symptom in a large number of chronic disorders, notably in syphilis, sarcoma, carcinoma, leprosy, scrofuloderma, carbunculosis and furunculosis, but may follow simple inflammatory conditions or diseases of the nerves. The destructive process may involve only the superficial layers, but as a rule it extends into the deeper cutaneous and subcutaneous structures. The base of the lesion may be smooth or uneven, and the sides sloping, abrupt or undermined. The exposed surface is generally moist and oozing, with a serous or purulent secretion, and a yellowish or brownish crust. The duration and course of ulcers vary with their cause. They may heal spontaneously, remain stationary or enlarge. Owing to the fact that the majority involve the connective tissue structures, healing is generally followed by scarring.

Scars.—Scars, or cicatrices, are connective tissue new formations which replace loss of substance in the fibrous layer of the skin. Scars may develop as a result of injury or of disease. They are often the sequelæ of ulcers, but they may develop, as in some cases of lupus vulgaris and syphilis, independent of surface ulceration. In atrophic scarring, cicatrices resulting from pressure (as in favus) or from overdistention (as in lineæ albicantes), the lesions are thin and pliable, while in scars of the hypertrophic type, such as those which develop as a result of penetrating, jagged wounds and severe burns, the new

growths are reddened or purplish at first, with rough, knobby surfaces, but may become whiter and smoother in the course of time. On the other hand, the hypertrophic process may persist, and involve the adjoining healthy skin, giving rise to the condition known as keloid. The shape of scars is largely determined by the character and extent of the destructive process which preceded them, and in many instances their contour and consistence are so distinctive that the parent condition can be readily diagnosticated. Thus, attacks of lupus vulgaris, acne varioliformis, lupus erythematosus, variola, some types of syphilis, and severe burns commonly result in tissue changes, which, to the eye of the initiated, are almost as characteristic as the immediate symptoms of the parent disease.

GENERAL DIAGNOSIS.

The ability to treat successfully diseases of the skin is not a gift, but simply a result of long continued, accurate observation and thorough, systematic training. The man who fails to diagnosticate correctly his cases, or to recognize and appreciate the various pathologic changes which underlie them, may succeed in posing as a "specialist," but he falls far short of being a dermatologist. Accuracy of expression is almost as essential as accuracy of observation, particularly if individuals other than the physician and the patient directly involved are to derive any scientific benefit from the case under consideration.

In many instances, and particularly in cases of an obscure or puzzling nature, the greater portion, or all of the patient's skin should be examined. This can be done piecemeal, if necessary, the patient removing and replacing each garment as the examination proceeds, but it should always be done carefully and thoroughly, especially if there is any doubt whatever regarding the character of the disorder. In the majority of instances, no dependence is to be placed on hearsay evidence.

Gentleness and tact should be exercised, particularly in dealing with women, and dispensary patients should receive the same courtesy and consideration as that extended to private patients. The examination should always be made in a routine manner. In this way the procedure gradually becomes a fixed habit with the examiner, and ultimately is carried out almost subconsciously. Every possible source of information should be utilized. In the diagnosis of cutaneous disorders it is unwise to place too much stress on the history. It is far better to first reach a definite conclusion regarding the diagnosis, and then let the history prove or disprove it as the circumstances may be. The name, sex, age, occupation and general condition of the patient should first be noted. Particular care should be exercised to learn the exact condition of the teeth and tonsils. The patient is then questioned regarding the duration, course and symptomatology of the disorder. The eruption as a whole should then be examined. For this purpose a good clear, natural light is essential. The room should be moderately warm, both for the comfort of the patient, and the effect on the cutaneous cir-

culation. In important cases careful notes should be made and photographs taken at the time of the first examination, as the eruption is liable to be considerably altered or obscured by treatment. Attention should be paid to the general condition of the skin, whether it is dry or moist, pigmented, rough, etc. The eruption may be universal, general or limited; it may be symmetrical, unilateral, irregular or disseminate. It may be uniform or variegated in color. Should the lesions be isolated and definite they may be few or many in number. The distribution and arrangement are important diagnostic points. Finally, the individual lesion should be studied, and its exact character, whether primary, secondary or exceptional, noted. A decision must also be made regarding its pathological nature. Often this can be done from a macroscopical examination alone, but in many instances it is advisable to study the material or tissues microscopically as well. Frequently, and especially in the mycotic disorders, a considerable amount of information can be gained from an examination of properly prepared exudates and scrapings, but in diseases involving the deeper structures it is occasionally necessary to excise small pieces of tissue for laboratory study. This operation is called a "biopsy" (Besnier). It is simple, and a fruitful source of valuable information. Its frequent employment cannot be too strongly urged. A small cutaneous punch can be employed for the purpose. For anesthetic purposes, Schleich's solution (No. 1) may be employed, the affected area being blocked off by a circle of injections several centimeters in diameter in order to avoid vascular or other changes in the specimen to be excised. The cylindrical column of tissue is drawn up as far as possible by means of a pair of mouse-tooth forceps and clipped off. The opening which remains is painted with tincture of iodine, and a dithymol diodide dressing applied. Biopsy wounds generally heal promptly, with very slight scarring.

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DISTRIBUTION AND TYPE OF ERUPTION AS DIAGNOSTIC FACTORS.

The distribution of an eruption is often suggestive from a diagnostic standpoint, as Pye-Smith, Gilchrist, Stelwagon and others have shown. Certain regions are relatively more susceptible to some diseases than others, and a knowledge of this fact is often of material aid in ar-

riving at a diagnosis. The following classification is a somewhat modified and considerably amplified form of the one suggested by Gilchrist. It includes only the commoner diseases.

MACULAR GROUP.

Macular Eruptions Occurring on the Face.—*Ephelides,* or freckles, are minute, circumscribed collections of pigment in the rete. They vary considerably in size and distribution, and give rise to no subjective symptoms.

Chloasma.—Excessive pigmentation, of asymmetrical distribution, usually on cheeks and forehead in women. Gives rise to no subjective symptoms.

Eczema Erythematosum.—Generally on face, or hands and forearms. Large, dry, reddish patches which soon ooze and later become scaly. Slightly infiltrated. Burns and itches. In infants it usually occurs on the cheeks as round or oval, symmetrically disposed, oozing, scaling or crusted patches.

Erythema Simplex.—Ill-defined, ephemeral, red spots on face and ears. Usually affected by sudden temperature changes. Slightly itchy at times.

Erythema Multiforme.—Seldom entirely macular. On face, ears and backs of hands. Symmetrical, sharply defined, reddish lesions. Some burning. Often associated with slight constitutional symptoms.

Erysipelas.—Usually on face. Commences at one point, commonly the site of some slight injury, and spreads rapidly. Branny, dark red, indurated, shiny lesions, with well-defined edges. Associated with constitutional symptoms.

Vitiligo.—Sharply circumscribed pinkish or whitish patches, often with an areola of hyperpigmentation. Usually on face, neck and hands. Skin soft, smooth and pliable. No subjective symptoms.

Xanthoma Palpebrarum.—One or more round, oval, or elongated, soft, wrinkled, chamois-colored patches on or about one or both eyelids. Usually in women. Develops slowly, and gives rise to no subjective symptoms.

Nævus Vasculosus.—Flat, vascular nævi occurring on the face are usually of either the talangiectatic (spider nævus) or port-wine stain (nævus flammeus) types.

Lupus Erythematosus.—Dry, red, scaly patches on cheeks, often symmetrical or butterfly-shaped (with a narrow band across bridge of nose). Usually young and middle aged women. Atrophic scarring. Exceedingly chronic. Seldom any subjective symptoms.

Syphilis.—Round or oval, pinkish or brownish macules, of symmetrical distribution. No subjective symptoms. Associated lesions on other parts of body, with lymphnode involvement, and otherwise discernible traces of a primary lesion.

Dermatitis Seborrheica.—Reddish, oval or irregularly shaped patches, covered with yellowish, greasy scales. Some oozing at times. Slight itching or prickling. Usually commences on scalp and extends downward, in median line, then laterally. Nasolabial folds and forehead, near scalp margin, and above and behind ears, frequently involved.

Acne Rosacea.—Ill-defined, dusky red patches on cheeks. Tip of nose, also usually involved. Sebaceous orifices patulous, skin cold, clammy and greasy. Dilated capillaries. Often some burning, but seldom any itching, present.

Ringworm.—Usually commences on face and other exposed parts. Begins as small, reddened spot, spreads peripherally, clearing up in center. Slight itching. Common in children.

Macular Eruptions Occurring on the Body.—*Erythema Intertrigo.*—Reddish, ill-defined patches on opposed areas. Some burning, little or no itching.

Pityriasis Rosea.—Usually begins with the development of a "mother spot" (Brocq), on lower trunk. Following this, the eruption quickly develops on trunk, arms and thighs. Oval or elongate, yellowish or pinkish macules, clearing up in center. The eruption is of symmetrical distribution, and gives rise to slight itching at times.

Eczema Erythematosum.—See under Macular Eruptions Occurring on Face. May become general.

Dermatitis Seborrheica.—Rounded or irregular, reddish patches, with yellowish, greasy crusts. Commonly involves sternal and interscapular areas. Occasionally attacks crural and axillary regions.

Dermatitis Medicamentosa.—The erythematous drug eruptions (the commonest being those due to antitoxin, belladonna, copaiba, quinine and the salicylates) are characterized by pinkish or reddish macular eruptions of symmetrical distribution, with more or less itching and burning.

Purpura.—Well-defined round or oval, irregularly distributed, reddish or purplish patches which do not disappear on pressure. The lesions gradually fade, becoming at first bluish, then greenish, and finally yellowish or yellowish-white. There are no associated subjective symptoms.

Scleroderma and Morphea.—Sharply circumscribed, round, oval or irregularly shaped, ivory colored patches. Sometimes apparently

slightly depressed. Hard and resistant to the touch. Firmly adherent to the underlying structures. Exceedingly chronic.

Atrophy of the Skin.—Senile atrophy and diffuse idiopathic atrophy of the skin are both marked by the occurrence of atrophic changes, with more or less integumentary wrinkling and occasionally pigmentation. Subjective symptoms are usually absent.

Nævus Vasculosus.—Vascular nævi may develop on the body as on the face, but as their presence gives rise to no physical discomfort, it is only occasionally that any attention is paid to them when located on the trunk. The so-called "cayenne pepper" type is probably the one most frequently encountered in this locality.

Syphilis.—Macular syphilides are pinkish or reddish in color, circular or oval in outline, and, in white persons, seldom give rise to subjective symptoms. Their distribution is symmetrical, and their presence is usually associated with beginning lymphnode involvement and other signs of lues.

Ringworm.—Ringworm of the body follows essentially the same course as ringworm of the glabrous portions of the face. In doubtful cases, the mycelia and spores can readily be found in scrapings from the margins of the lesions.

Tinea Cruris.—In cruroscrotal folds and in the axillae, raw, reddish patches, with sharply defined, festooned or circular margins. Eczematous. Itchy. Mycelia and spores easily found.

Tinea Versicolor.—Commonly on the chest and back. Dry, fawn-colored, finger-nail-sized patches, which gradually spread, and soon become confluent. No subjective symptoms. Diagnosis easily verified with microscope.

Erythrasma.—Reddish-brown patches in genitocrural and axillary regions. Slight itching. Superficially resembles tinea versicolor. Distribution is different. Verify microscopically.

PAPULAR GROUP.

Papular Eruptions Occurring on the Face.—*Papular Eczema.*—Lesions usually mixed in character, macules, papules and vesicles. Ill-defined, reddish, oozing patches. Occasionally, small bloody crusts. Intense itching, and some burning.

Molluscum Contagiosum.—Rather uncommon. Small, globular, shining flat-topped, umbilicated lesions, single or grouped. Persistent. No subjective symptoms.

Adenoma Sebaceum.—Uncommon. Patients usually mentally below par. Lesions appear early in life. Pinhead- to pea-sized papules, pink-

ish or reddish in color, with smooth and glistening or somewhat roughened surfaces, and often accompanied by capillary dilatation.

Fibroma.—Pinhead-sized and larger, firm, pinkish or brownish growths. Develop slowly and persist indefinitely. Asymmetrical, and do not give rise to subjective symptoms.

Papular Syphilis.—Small or large, multiple papules. Reddish or brownish in color, symmetrically distributed, with associated lesions on body. Lymphnode involvement.

Lupus Vulgaris.—Usually commences early in life, as pinhead- to pea-sized, apple-jelly-colored nodules (best seen with aid of diascope). Gradually progressive, giving rise to rather thick, fibrous, corded cicatrices. Reacts to tuberculin.

Papular Eruptions Occurring on the Body.—*Prurigo.*—Rare in America. Develops in early childhood as a discrete, pinhead- to small pea-sized, intensely itchy, reddish, papular eruption. Predilection for anterior surface of limbs. Exceedingly persistent. Lesions do not change in character.

Erythema Nodosum.—Large, flat, reddish or purplish, papular or nodular lesions, usually on legs. Symmetrical and quite tender. Occasionally associated with fever and arthritis.

Lichen Planus.—Small, angular, flat-topped, reddish or purplish, shiny, papules with a tendency to umbilication. Always dry, and usually discrete, but may coalesce. Flexor surfaces of forearms, and inner surfaces of thighs almost invariably involved. Intensely itchy.

Lichen Scrofulosus.—Uncommon in America. Linseed-sized, rounded or flattened, pinkish, yellowish or brownish, grouped papules. Generally involve lower two-thirds of trunk and occasionally the limbs. Most frequent in tuberculous individuals. No subjective symptoms.

Psoriasis Vulgaris.—Pinhead- to pea-sized, bright red, non-inflammatory papules, covered with silvery, white, umbilicated scales. The papules usually become confluent, forming thumb-nail to palm-sized areas. Bases of lesions not infiltrated. Papillae are hypertrophic. Papillary vessels readily exposed by scraping off the thin layer of overlying scales. Usually chronic, but may be acute. Extensor surfaces of elbows and knees involved early. Eruption gradually extends toward median line of body. No constitutional or subjective symptoms.

Papular Eczema.—Eruption generally patchy, and confined to limbs. Papules red, shiny, often capped by small, bloody crusts. Usually associated with erythematous lesions, red, oozing and crusted. Intense itching, some burning. Distribution asymmetrical.

Keloid.—Pea-sized or larger, hard, rounded or knobby, pinkish or whitish, glistening lesions which develop at the site of a former injury. Slightly painful at times. Chronic.

Syringocystadenoma.—Soft, whitish or pinkish, round-topped lesions, usually grouped. Most frequent in axillary regions. Chronic, and give rise to no subjective symptoms.

Xanthoma Diabeticorum.—Pinhead- to pea-sized, papular or nodular lesions, with reddened bases and yellowish tops. Predilection for buttocks, forearms, elbows and knees. Slight itching and prickling at times.

Fibroma.—Pinhead-sized or larger, firm, pinkish or brownish lesions. Develop slowly and persist indefinitely. Asymmetrical. No subjective symptoms.

Papular Syphilis.—Pinkish, reddish or brownish, pinhead- to pea-sized papules, of symmetrical distribution. Frequently associated lesions on face and mucous surfaces. Lymph nodes palpable. Usually traces or history of primary lesion. Wassermann serum test generally positive.

Miliaria.—Numerous pinpoint- to pinhead-sized, pinkish or reddish inflammatory papules. Usually interspersed with vesicles or papulovesicles. Usually preceded or accompanied by excessive sweating. More or less prickling, itching and burning. Lesions develop quickly, involve extensive areas and last for a week to a fortnight. There are no constitutional symptoms.

Sporotrichosis.—Large papules or small nodular tumors, dark red in color and painless, usually develop along course of lymphatics, most frequently on the arms or legs. Primary lesions, following slight injury, commonly demonstrable. Centers of lesions break down in course of a fortnight or two, and a small fluctuating tumor results. This may persist for months. If incised, a chronic ulcer results. Slight subjective, and no constitutional symptoms. Fungus easily cultivated.

Vesicular Eruptions Occurring on the Face.—*Eczema Vesiculosum.*—Small, crowded vesicles, many with scaly, bloody crusts. Usually associated with reddened inflammatory papules, and more or less oozing. Symmetrical, patchy distribution. Intense itching and some burning.

Herpes Simplex.—Commonly develops as the result of some febrile disorder. Sharply defined, closely grouped, pinhead -to pea-sized vesicles. Oral or genital regions most frequently involved.

Herpes Zoster.—Characterized by the occurrence of groups of acute, inflammatory vesicles along the course of a nerve. Generally unilateral. Supraorbital branch of the fifth most frequently involved on face. Some pain, burning and itching. Slight constitutional symptoms at times.

Impetigo Contagiosa.—Very common. Commences as one or more clear, rounded or flat-topped, superficial, pinhead- to pea-sized vesicles. The serous contents quickly become purulent and soon dessicate, forming thin, moist, yellowish crusts with upturned edges. The disorder is quite contagious, and may become epidemic in orphanages and schools. Subjective symptoms practically nil.

Varicella.—Numerous delicate, superficial, thin-walled, pea-sized vesicles on face, mouth, and body. Usually in children. Eruption roughly symmetrical. Some accompanying fever, and lymphnode involvement.

Pemphigus.—Occasionally involves face. Variously sized, round or oval, distended or flaccid vesicles and bullae, developing suddenly on apparently normal skin. Associated involvement of body. No constitutional symptoms. Itching and burning at times.

Vesicular and Bullous Eruptions Occurring on the Body.—*Erythema Multiforme Bullosum.*—Occasionally associated with macular, papular and tubercular lesions. Round, or oval, at times iris-like bullae. Usually roughly symmetrical distribution, involving face, and backs of hands and forearms. Develop suddenly and persist for several days to a fortnight or more at times, then regress. Constitutional symptoms (fever and arthritis) at time. Slight burning and itching.

Eczema Vesiculosum.—Occurs as irregular groups or patches of vesicles, interspersed with macules and papules. Oozing and crusting. Bases red and slightly infiltrated. Eruption seldom retains same character longer than a few days at a time. Intense itching, and some burning.

Herpes Simplex.—Groups of clear, thin-walled, vesicles on an inflamed base. Develops suddenly. May become pustular, or vesicles may rupture, leaving only raw, reddened, moist bases. Usually in genital region.

Herpes Zoster.—Groups of acute, inflammatory vesicles along the course of a nerve, generally unilateral. Most frequent in intercostal regions. Some pain and burning. May be accompanied or followed by subjective symptoms of neuritis.

Pompholyx.—Acute, inflammatory, deep-seated vesicles or bullae, developing suddenly on the palms and soles, and occasionally involving the flexor surfaces and sides of the fingers and toes. Some pain and tension. Develops oftenest in neurotic individuals, and in tobacco users.

Dermatitis Herpetiformis.—Discrete collections of deeply-seated vesicles, occasionally associated with macules and papules. Chronic. Re-

mittent. Frequently some scarring. Intensely itchy. Patients are usually neurotic individuals, in early and adult life.

Pemphigus.—Uncommon. Scanty or numerous, irregularly distributed, rounded or oval bullae, which develop suddenly on apparently normal skin. The acute type may develop following an injury, but no cause can generally be ascribed in the chronic, and usual, form. Some itching and burning. Lesions regress, or rupture and dessicate, forming thin crusts. Chronic. Remittent.

Epidermidolysis Bullosa.—Uncommon. Variously sized and shaped vesicular and bullous lesions which develop as a result of bruises and similar injuries. Almost invariably congenital. Bullae contain serum, or serum and blood. Usually heal promptly, but may give rise to slight scarring or atrophy.

Varicella.—Discrete, superficially seated, pinhead- to pea-sized vesicles. Develop suddenly. Associated fever. Malaise and slight lymph-node involvement. Usually in children.

Scabies.—Groups of minute vesicles and pustules, on reddened bases, in interphalangeal and anterior axillary folds. Frequently affects palms and anterior surfaces of the wrists in children. Intense itching, worse at night.

Pustular Eruptions Occurring on Face.—*Infectious Eczematoid Dermatitis.*—Discrete, scaly, reddened, patches of minute papules and pustules, with more or less crusting. Some oozing, and slight itching at times. Generally develops following furunculosis or other staphylococcic infection.

Impetigo Contagiosa.—See under Vesicular Eruptions Occurring on Face.

Furunculosis.—Single or multiple, large, deep-seated pustules, commonly developing in a hair follicle or sebaceous gland. Reddish or purplish in color. Very painful and tender. Common on back of neck, at hair margin.

Variola.—Multiple, pinhead- to pea-sized pustular lesions, with reddened, infiltrated bases. Associated involvement of body and limbs, particularly the palms and anterior surfaces of wrists. Constitutional symptoms.

Pustular Syphilis.—Uncommon. Pinhead- to bean-sized, pustular lesions, involving face and entire body. Symmetrical distribution. Associated involvement of lymphnodes and mucous surfaces. Serum test generally positive.

Acne Vulgaris.—Deep-seated or superficial pustules, interspersed with papules and nodules, on face, back and chest. Lesions involve lanugo

hair follicles or mouths of independent sebaceous glands. Many contain comedones (blackheads). Usually associated seborrhea ("oiliness") of skin.

Acne Varioliformis.—Rather superficial, small, papulopustular lesions, discrete or grouped, on face and forehead. Generally follicular. Chronic. Give rise to small, round or oval, punctate, variola-like scars.

Pediculosis Capitis.—Frequently gives rise to pustular lesions in parietal regions and back of ears. May give rise to an infectious eczematoid dermatitis.

Pustular Eruptions Occurring on Body.—*Ecthyma.*—Pinhead- to thumb-nail-sized, discrete, crusted, inflammatory pustules. Commonly affects shins, particularly during summer. Lesions reddish in color, tender and painful. Give rise to superficial scars on healing.

Furunculosis.—Single or multiple, large, deep-seated pustules. Commonly develop in a hair follicle or independent sebaceous gland. Reddish or purplish in color, and very painful. Common on buttocks and limbs.

Infectious Eczematoid Dermatitis.—See under Pustular Eruptions Occurring on Face.

Pustular Syphilis.—See under Pustular Eruptions Occurring on Face.

Acne Vulgaris.—See under Pustular Eruptions Occurring on Face. Lesions frequently develop on chest and back.

Pediculosis Corporis.—May give rise to papular and pustular lesions in scapular regions and along seam lines.

Scabies.—Often gives rise to vesicopustular lesions in anterior axillary and genital regions.

REGIONAL DISTRIBUTION OF THE COMMONER DISEASES OF THE SKIN.

Scalp.—Seborrheic dermatitis, eczema, psoriasis vulgaris, ringworm (children only), lupus erythematosus, pediculosis capitis, infectious eczematoid dermatitis.

Alopecia.—Alopecia pityroides, alopecia areata, secondary syphilis, folliculitis decalvans.

Unclassified.—Gumma, carcinoma cutis, verruca, sebaceous cysts.

Face.—Freckles, chloasma, leucoderma, eczema, seborrheic dermatitis, dermatitis venenata, impetigo contagiosa, erysipelas, acne rosacea, secondary syphilis, lupus erythematosus, ringworm, erythema multiforme,

lupus vulgaris, seborrheic keratosis, carcinoma cutis, herpes simplex, herpes zoster, milium, molluscum contagiosum, xanthoma palpebrarum (eyelids).

Bearded Region.—Impetigo contagiosa, eczema, sycosis vulgaris, tinea barbae, alopecia areata.

Lips.—Herpes simplex, carcinoma cutis, chancre, cheilitis exfoliativa, cheilitis glandularis apostematosa, Fordyce's disease, urticaria gigans.

Tongue.—Leucoplakia, chancre, gumma, carcinoma, transitory benign plaques.

Chest and Shoulders.—Seborrhea, acne vulgaris, secondary and tertiary syphilides, tinea versicolor, seborrheic keratoses, scabies, psoriasis, pediculosis corporis, drug eruptions, the acute exanthemata.

Breasts.—Eczema, infectious eczematoid dermatitis, carcinoma, Paget's disease, scabies, erythema intertrigo.

Trunk.—Eczema, infectious eczematoid dermatitis, purpura, seborrheic dermatitis, pityriasis rosea, urticaria, herpes zoster, syphilis, psoriasis.

Hands and Feet.—Leucoderma, dermatitis venenata, eczema, scabies, hyperidrosis, pompholyx, palmar and plantar keratoses, infectious eczematoid dermatitis, erythema multiforme, syphilis, dermatitis repens.

Forearms and Legs.—Infectious eczematoid dermatitis, eczema, ecthyma, urticaria, lichen planus, psoriasis (extensor surfaces of elbows and knees), erythema multiforme, erythema nodosum, leucoderma, purpura, keratosis pilaris, gummata.

Genital Region.—Pruritus, scabies, seborrheic dermatitis, herpes simplex, chancre, chancroid, lichen planus, carcinoma, dermatitis venenata.

Anal Region.—Pruritus, eczema, condyloma, fissures.

Crural and Axillary Regions.—Ringworm, seborrheic dermatitis, erythema intertrigo, eczema, scabies (in axillary folds), furunculosis and infectious eczematoid dermatitis.

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TREATMENT.

The treatment of skin diseases is both internal, or constitutional, and external, or local. In some instances, both internal and external medication may be indicated, in others, the one or the other. A generation ago many of the disciples of the elder Hebra argued much in favor of the employment of external measures only, no matter what the nature of the disorder might be, but time and experience have demonstrated the frailty of their reasoning, and now it is generally recognized that the purely local cutaneous maladies are indeed few and far between. In many instances constitutional treatment is intended more for the purpose of increasing the bodily resistance of the patient than for any direct or specific effect it may have on the causative factor. Constitutional remedies may be separated into three classes—hygienic measures, indirect medicinal agents, and direct medicinal agents. From the standpoint of prophylaxis, the first of these is by far the most important. That properly selected food, thoroughly masticated, moderate exercise, plentiful amounts of pure, soft, drinking water, sunny living rooms, well ventilated sleeping quarters, abstinence from alcohol, tobacco and coffee, all tend to promote the good health and general well-being of any individual goes without question. The nearer we approach this ideal state of affairs, the more successful we shall be in combating the physical disabilities, cutaneous and otherwise, of our patients. The average individual eats too much food of high caloric value, takes too little exercise, and drinks too little water. It is not possible, however, to lay down hard and fast rules regarding exercise. The majority of us recall, with a smile, the experience of a distinguished colleague, who advised a new patient that all he required was a moderate amount of vigorous exercise, only to discover later that his patron was an instructor in physical training! Alcohol is detrimental in practically all cutaneous disorders, and tobacco, coffee and tea, in even moderate amounts, are apt to do harm and seldom, if ever, do good. In the field of drugs, the value of only a comparative few has been authoritatively proved.

INTERNAL TREATMENT.

Cathartics and Diuretics.—In the majority of the acute, congestive disorders of the skin the use of both cathartics and diuretics is indicated. The saline preparations, particularly magnesium sulphate and citrate and sodium phosphate, are particularly valuable. They are best given in small amounts of water, on an empty stomach. Mistura ferri acidi (Startin's mixture) is an efficient, but not particularly palatable, mixture of magnesium sulphate (oz. iv—128.0), iron sulphate (gr. xvi—1.0), dilute sulphuric acid (oz. i—32.0) and water (oz. xvi—512.0), a tablespoonful, with water, before breakfast, is probably the most popular of the stock prescriptions. In chronic constipation, so common in women, nothing is so satisfactory as one of the cascara preparations, alone or with bile salts. The combination known as "Hinkle's pill" often serves the purpose admirably. In recent years, Russian oil, which acts principally as a lubricant, has met with wide popularity in this country. Of the alkaline diuretics, sodium citrate and sodium acetate are probably the best. In writing prescriptions for liquid mixtures, care should be taken to avoid the use of the so-called "proprietary" vehicles. We have no right to force our patients to pay a fancy price for some pretty and pink, but therapeutically worthless, vehicle, when peppermint water will serve as well, or better.

Sedatives.—Opium and its various derivatives are, as a rule, of little value in diseases of the skin. They relieve the pain in herpes zoster and in carcinoma, but in combating the commonest of all symptoms, itching, they not only bind up all the secretions, but render the patient more uncomfortable than ever by increasing the intensity of the pruritus. For sedative purposes, the bromides, preferably a mixture of the salts of sodium, potassium and strontium, are the most satisfactory. Fairly large doses (dr. ss. to dr. 1-2.0 to 4.0), with plenty of water, every three to six hours, should be given until the physiological effect is secured, when the amount may be lessened. It is unwise to continue the administration of even this comparatively harmless agent over long periods of time. Cannabis indica has been highly recommended, particularly in pruritus, but in my hands has proved an unreliable drug. As a narcotic, veronal or sulfonal may be used.

Intestinal Antiseptics.—Experimental studies would indicate that at this time we possess no remedy that can rightfully be classed as an intestinal antiseptic. Certain well-known drugs, such as salol, ichthyol,

betanaphthol, copper arsenite and resorcin, possibly aid in preventing fermentation to a certain degree, but the best method of overcoming putrefactive and similar changes in the alimentary canal is to sweep the tube out regularly and thoroughly. Uniform habits at stool, copious water drinking, food with plenty of débris, and the use, when necessary, of one of the cascara preparations, supplemented if need be, by bile salts or salines, will minimize the demand for drugs of this character.

Mineral Waters.—The value of the various natural mineral waters in the treatment of diseases of the skin has been greatly exaggerated. In fact, judging from my experience with patients who have spent much time sojourning at the various watering places in the Middle West, I should say that the average case derives more harm than good from the treatment received. One occasionally encounters examples of generalized eczema or dermatitis exfoliativa that have been soaked and scrubbed, boiled and parboiled, during a visit at one of these "healing springs," and finally finished off with one or two intravenous doses of neosalvarsan, probably administered with the futile hope that good might result. The wonderful cures of syphilis claimed by the natural mineral water enthusiasts are the result of thorough arsenical and mercurial medication, and can be duplicated anywhere in America by the systematic use of the same drugs, supplemented by an occasional hot bath, taken at home.

Arsenic.—In addition to its properties as a general tonic, arsenic, when taken internally, exerts a specific action on the epithelial layers of the integument. This effect varies from a slight stimulation of nutrition to the development of epithelial changes which may foster, if they do not actually incite, malignancy. Between these extremes, innumerable degrees of alteration occur. The most common is diffuse or circumscribed pigmentation, with or without hyperkeratization, erythema (which may simulate lichen planus, seborrheic dermatitis, psoriasis or papular syphilis), desquamation, and atrophy. Formerly, arsenic was very widely employed in the treatment of the diseases of the skin. One might almost truthfully say that it, with sulphur, occupied the top seat in dermatologic therapeutics. In recent years, however, the tendency has been to restrict its employment to those diseases which are actually benefited by its use, and as a result the list has been greatly curtailed. In addition to the so-called three Ps (psoriasis, lichen planus and pityriasis rubra pilaris, which might better be changed to psoriasis, pityriasis rubra

pilaris and pellagra), the various preparations of arsenic often prove valuable in the treatment of syphilis, granuloma fungoides, and sarcoid. Some persons undoubtedly have an idiosyncrasy for the drug, and it is always well to commence with small doses. When administered by the mouth, arsenic should always be taken after meals, and the amount gradually increased. It is generally prescribed in the form of liquor potassii arsenitis, sodium cacodylate, or arsenious acid. The last named preparation was formerly employed very frequently as an ingredient of the so-called "Asiatic pill," but its use is less popular at this time.

Sodium Cacodylate.—Sodium cacodylate (sodium dimethylarsenate) is a tonic and hematinic of considerable value, which should be given intravenously or subcutaneously. Its qualities have been recognized for many years. Recently it was widely heralded as a valuable remedy in syphilis, largely because of the enthusiastic recommendation of a distinguished Chicago surgeon, but a thorough trial failed to establish its power as a curative agent in this disease. In fact, Nichol's thorough and authoritative tests on rabbits proved the drug to be absolutely worthless as a spirocheticide.

During the past decade, a number of arsenical preparations have been introduced with the claim that they possess specific treponemicidal properties. Chief among these are atoxyl, arsacetin, soamin, hectine, arsphenamine, neoarsphenamine, sodium salvarsan, and arsenobenzol. The principal object in compounding an agent of this character is to secure a preparation which will have a maximum injurious effect on the invading organism and a minimum evil effect on the host. Of the drugs mentioned, at least two have been found to be exceedingly dangerous to the host, principally because of the apparent affinity of their arsenic radicals for certain nerve structures (particularly those of the second cranial). At this time arsphenamine is generally recognized as the most efficient of the safer members of the group.

Mercury.—The mercury preparations, aside from their excellence as cathartics, are particularly valuable in the treatment of syphilis and of lichen planus. In the latter disorder they constitute the most potent remedy now at our disposal. Although commonly employed in the form of the protiodide, by the mouth, mercury is far more efficient when administered intramuscularly. The intravenous route also may be employed, but has met with very little favor in this country. Next to the intramuscular injections, inunctions are probably

the most valuable, but they must be employed systematically and conscientiously if the maximum amount of benefit is to be derived.

Iodine and the Iodides.—The rôle of the iodides in dermatology is practically confined to their use in syphilis, sporotrichosis, blastomycosis and actinomycosis. The potassium salt is the one most commonly prescribed, although the sodium preparation is equally efficient, and probably far less irritating to the renal epithelium. The iodides are particularly valuable in tertiary syphilis and in sporotrichosis. In the latter disease they constitute almost a specific. In lues it should always be borne in mind that these salts are not treponemicidal in their action, but serve only as an aid in the dissolution of gummatous infiltrations, and that either arsenic or mercury, or both, must be added in order to bring about a cure. I have found some of the soluble preparations of iodine, which are usually but a solution of iodine with an iodide salt in dilute alcohol, of service when administered hypodermatically. When the drug is employed by the mouth, it should be given after meals, well diluted, and followed by a tumblerful of water or sweet milk. A very satisfactory method of administering iodide in large doses is to dissolve an ounce of the potassium or sodium salt in one gallon of water, this amount to be drunk daily. It can be kept in four one-quart milk bottles, in a refrigerator, and a tumblerful taken at regular intervals. The method originated, I believe, with Dr. Sanger Brown, and in my hands has given excellent results.

Salicin and the Salicylates.—Salicin, sodium salicylate, and similar preparations have been highly lauded by Crocker, Hartzell and others for their beneficial effect on the lesions of psoriasis, lichen planus and granuloma fungoides. My experience with these drugs in the above dermatoses has been far from satisfactory, in fact, I have never been able to note any improvement following their use, but in view of the distinguished standing of the gentlemen who have recommended them the remedies deserve at least a trial in obstinate examples of these disorders.

Quinine.—Some of the various cinchona preparations prove of value in cutaneous disorders which originate from, or are associated with, nerve disturbance. They may be of service in pemphigus, dermatitis herpetiformis, pruritus, and dermatitis exfoliativa.

Ichthyol.—Much of our present knowledge regarding the use of ichthyol as a remedy, both constitutional and local, we owe to Unna. Taken internally, in solution or in capsule, it is believed to exert a

contractile influence on the dilated and congested capillaries in hyperemic disorders like acne vulgaris, acne rosacea and lupus erythematosus. In my experience, its value as an internal remedy is practically nil. Ichthalbin and thiol are allied preparations, supposed to possess similar properties.

Sulphur.—Despite its great reputation as a "blood cleanser and purifier" among the laity, sulphur probably exerts very little influence on the body when taken internally. Aside from its laxative effect, and possibly a very slight stimulating action on the epithelial layers of the integument, its therapeutic properties are problematic. Various preparations and combinations which depend upon the activity of their sulphur radical for their therapeutic effect are even less valuable than the parent drug itself. Chief among these I would place a much advertised tablet of calcium sulphide. I have employed and repeatedly seen others employ this drug over long periods of time, in various staphylococcic infections, such as furunculosis, carbunculosis and sycosis vulgaris, and if any improvement ever resulted it was certainly inappreciable to the naked eye.

Pilocarpin.—Pilocarpin stimulates sweat secretion, and is supposed to exert considerable influence on the hair bulbs. In certain inactive states of the skin, accompanied by itching, its cautious administration is sometimes followed by alleviation of the pruritus. A similar result occasionally can be secured in urticaria and other angioneurotic dermatoses.

Thiosinamine.—Thiosinamine and its allied preparation, fibrolysin, have been highly recommended as remedies in keloid and similar conditions. They are employed hypodermatically, and injected into and around the cicatricial growth. Their administration is generally quite painful and tedious, and in my experience they are much inferior to both the x-ray and carbon dioxide snow.

Calcium Lactate.—Through the work of Wright, Paramore, and others we have learned that the coagulability of the blood is considerably diminished in a number of cutaneous disorders, particularly urticaria, pernio, purpura, and edema circumscriptum acutum. By experience, it was learned that the ingestion of acids increased this fault and that milk decreased it. Consequently, Wright and his followers have suggested the administration of certain of the calcium salts, particularly the lactate, to overcome this deficiency. It is probable that some benefit may be derived from their use, but the last word has yet to be written on the subject.

Animal Extracts.

Adrenalin.—Adrenalin is a powerful local and general hemostatic. As marketed, it consists of a 1:1000 solution of the glandular extract in decinormal salt solution. McGowan and others have found it useful in urticaria, purpura and erythema multiforme. It is a potent drug, however, and care must be exercised in its use or disastrous results may follow. Particularly is this true if the patient is suffering from arteriosclerosis, or a dilated or weakened heart. Its effect is only temporary, but the dose may be frequently repeated, and continued over a considerable period of time, if necessary. In young, vigorous individuals the dose may be gradually increased to 1.0 c.c. (mxv) or more, every three or four hours. I have found the drug of value in urticaria, and in acute eczema accompanied by low blood pressure.

Thyroid.—Thyroid extract owes much of its earlier popularity as a medicinal agent to Byron Bramwell. Unfortunately, all who prescribed it were not so scientific or so conservative as its distinguished sponsor, and in many instances its use has undoubtedly resulted in more damage than benefit. There can be no question of its value in myxedematous conditions and even in unrelated disorders occurring in myxedematous subjects its administration is often followed by a considerable degree of general improvement. The indiscriminate use of so powerful an agent is not to be countenanced, however, and in doubtful cases too much care cannot be exercised regarding its administration. Freshly prepared tablets of the desiccated gland, put up by a reliable firm, should be employed, and the initial dose should never exceed three grains. If the remedy is to be pushed, the patient should be kept in bed, and under constant observation. Thyroid occasionally proves beneficial in psoriasis, ichthyosis and chronic eczema.

Tuberculin.—Tuberculin, like many other two-edged remedies, has been employed with enthusiasm, discarded with disdain, and is only at this time, years after its introduction, beginning to come into its own. Even now it is more valuable as a diagnostic aid than as a therapeutic agent, but it undoubtedly possesses much curative power, if properly employed. For diagnostic purposes, the old tuberculin is generally used, and any one of five different methods may be employed. Probably the most reliable, but not the least dangerous, is the old subcutaneous injection and general reaction method of Koch. The von Pirquet test is dependent upon a local cutaneous reaction, and

is generally carried out on the skin of the upper arm. Three minute scarifications are made, 5 cm. or more apart, and arranged in a straight line. A drop of old tuberculin is placed on each of the terminal areas, and allowed to dry. The third scarified area serves as a control. The reaction occurs in from 12 to 48 hours. The Moro, or inunction, test consists in the application of a small amount of 5 per cent tuberculin ointment (in anhydrous wool fat), to the unbroken skin. The Ligniere is quite similar, plain tuberculin solution being employed in place of the ointment combination. The Calmette, or ophthalmic, reaction stands next to the injection method in point of delicacy, but experience has shown that the increased sensitiveness is more than counterbalanced by the danger incurred, permanent injury to the eye occasionally following its use.

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Vaccine Therapy.

Wright first made public the results of his work on opsonic therapy in 1903, and during the following decade this method of treatment received an exhaustive and thorough trial in all parts of the civilized world. Wright and Adami both warned the profession against the indiscriminate use of stock vaccines, particularly those of the mixed type, but this conservative advice was for the most part unheeded, at least in America. While it has been shown that an estimation of the opsonic index is not absolutely necessary in every instance, one should possess at least an elementary knowledge of bacteriology and immunology if one is to employ the method intelligently. Unfortunately, many who used these preparations lacked not only these two essentials, but often a clear conception of etiology as well. To guard against these shortcomings, some of the pharmaceutical houses supplied vaccine containing two, three or even more different organisms—veritable shotgun prescriptions, which were in some instances positively dangerous, and only occasionally of any therapeutic value. To one who has had considerable experience in vaccine therapy, it would appear that the maximum efficiency can be secured only by the employment of properly graduated doses of bacterin made from or-

ganisms of the specific strain and type of those to be attacked. The further one deviates from this standard the less satisfactory will be the result. Stock vaccines may be of service, but in my hands they have proved exceedingly unsatisfactory, in fact practically worthless. I have found properly prepared autogenous vaccines valuable in the treatment of furunculosis, carbunculosis, infectious eczematoid dermatitis, and dermatitis repens. In acne vulgaris and sycosis vulgaris, brilliant results have sometimes followed their use, but as a rule their effect has been disappointing.

The results of recent investigative work indicate that bacterin therapy is in reality the result of an anaphylactic reaction, and not a reaction to any specific proteid. Leudke, Kraus, J. L. Miller, and others have found that just as good results can be obtained in typhoid fever by injections of colon vaccine, or even of proteins, albumose, etc., as by the administration of typhoid bacterin, and the same holds true in other, if not all, specific acute infections. To quote David John Davis: "Recent work tends to show that many substances, the so-called foreign proteins and their derivatives, may, when injected especially into the veins, quickly cause a severe chill followed by high fever, leukocytosis and certain changes in the blood, especially the appearance of ferments. These proteins may be derived from disease germs or they may consist of other animal substances, as serum, proteoses and milk. After the rather severe reaction, marked improvement and even permanent cure may result in certain diseases, especially typhoid, and in rheumatic and gonococcus infections. This may be due to the high fever and to increase in the ferments and leukocytes of the blood. Other factors are probably at work.

"The non-specific effect of vaccines is just now probably the most important problem that concerns the vaccinationist. The possibilities of development along this line are many, for the principle concerns an immense number of diseases, both in man and the lower animals. Questions concerning ultimate cure, recurrences, relapses and dangers cannot now be justly appreciated because of lack of data.

"This form of treatment should be referred to neither as specific nor as vaccine therapy. It is non-specific, and usually, but not necessarily, protein therapy.

"The important domain of vaccines is protective, not curative, according to present data."

Tuberculin ointment has been used with some success in the treatment of lupus vulgaris, and Gilchrist noted marked improvement in

two cases of pruritus ani, accompanied by inflammation, which were treated with staphylococcus albus ointment. Similar preparations appeared to benefit a case of sycosis vulgaris, and a stubborn case of seborrheic dermatitis became distinctly better under applications of bacillus acnis ointment. The exact method of action in these cases is problematic, but the character of the results obtained is encouraging.

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Autogenous Serum and Foreign Proteins.—The treatment of certain chronic and obstinate dermatoses by injections of human blood serum, autogenous or homologous, has recently been employed with a considerable degree of success. The therapeutic action is not understood, but the reaction is probably dependent upon the introduction of a foreign proteid with ensuing anaphylactic phenomena. Luitlen concluded that the effect of the serum was not due to its antigenic function, but to the introduction into the system of a colloidal complex, which brought about changes the character of which is as yet unknown. In psoriasis, the best results are secured by the concomitant use of a weak chrysarobin ointment (from 2 to 10 per cent). Under this combined plan of treatment, the lesions in many instances regress very rapidly. The method is a very simple one. About 50 c.c. of blood are secured by venipuncture from the cubital vein, and centrifuged. The supernatant serum is pipetted off and injected at once, either intramuscularly or intravenously. From three to ten injections are given, at intervals of from three to five days.

Engman and McGarry, Duke, Scully, and others have successfully employed foreign protein in the form of typhoid vaccine prepared from an active culture in the treatment of psoriasis, urticaria, and other disorders. The vaccine is diluted so that each cubic centimeter contains 100,000,000, and is best administered intravenously. The average dose is 75,000,000, and from three to ten injections are given, at intervals of from three to seven days.

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EXTERNAL TREATMENT.

The skin is constantly exposed to parasitic attack. When one considers the number of micro-organisms that perpetually use its surface as an abiding place, the comparative freedom of this organ from disease is almost marvelous.

The local applications employed in dermatology can be broadly divided into five groups: Cleansing agents, soothing and protective applications, antipruritics, keratolytics, and reducing agents.

Baths are used for cleansing purposes, and are also employed medicinally as palliative and curative measures. Generally speaking, in very active hyperemic states, such as acute eczematous conditions, baths are contraindicated. If employed at all, the water should be soft, and no soap, or a soap as nearly neutral as possible, added. Scales and crusts may be removed by means of olive oil or starch poultices. Probably the best method of cleansing oily, greasy surfaces is with deodorized benzine, applied by means of a cotton swab. When employed only occasionally, once a day or on alternate days, this agent seldom gives rise to any irritation, and it is certainly very effective. Alkaline baths and tar baths are sometimes employed in the treatment of psoriasis and chronic eczema, and sulphur baths may be of service in scabies. The use of the continuous bath is advisable in some of the more severe forms of pemphigus and in extensive burns. Soaps, medicated and otherwise, are occasionally of service in the treatment of chronic cutaneous disorders. For cleansing purposes, old, well-dried Castile soap is probably the best and least irritating. When a keratolytic effect is desired, as in psoriasis, seborrheic dermatitis and acne vulgaris, a highly alkaline preparation, like sapo viridis, is to be preferred. Personally, I have found soaps containing varying amounts of powdered pumice stone quite valuable in the treatment of acne vulgaris. The results of experimental investigation indicate that medicated soaps, and particularly the so-called antiseptic soaps, possess very little therapeutic value, and the reports of many widely experienced clinicians corroborate these laboratory findings.

Soothing, Protective, and Antipruritic Applications.—In cutaneous therapy, the relief of irritation is frequently a cardinal indication.

This need may be met by the use of direct sedatives or anesthetics, the employment of dressings which exclude the external air, the application of mild astringents, or the use of evaporating lotions. Commonly recourse is had to a lotion containing carbolic acid, zinc oxide, starch and powdered calamine, in water, or in equal parts of lime water and olive oil. This mixture is antipruritic, soothing, protective and cooling, while a lotion containing small amounts of opium and lead acetate is sedative, astringent, cooling and slightly antipruritic.

Ointments.—Ointments have a wide sphere of usefulness in the treatment of diseases of the skin. They consist of fats of various kinds, in which divers medicaments are suspended or dissolved. Goose grease is probably the most penetrating of these vehicles, and anhydrous wool fat the least. The value of the latter is greatly augmented, however, by its ability to take up water in varying amounts. Vaseline is a poor penetrant, but a fairly good protective. Compound fats are mixtures of spermaceti and olive or almond oil. As a rule, the proprietary ointment preparations for which great penetrative powers are claimed, should be viewed with suspicion. The employment of powerful local sedatives and anesthetics (cocaine, for example) is to be discouraged, for in addition to the ultimate damage they may exert on the tissues, the patient is exposed to the liability of incurring a dangerous drug habit. Of the various antipruritics at our disposal carbolic acid (phenol) is undoubtedly the most efficient and reliable. It should never be applied in ointment form beneath bandages. It may be employed in strengths of from 0.5 to 2. per cent. in lotions or in salves, or, if combined with equal parts of liquor potassæ, in oil, solutions of 15. per cent or even stronger, may safely be applied to small areas (Bronson). Menthol substitutes a sensation of coldness for that of itching, and occupies a position in value next to that of carbolic acid. Some of the synthetic drugs, as orthoform and cycloform, prove serviceable at times. The latter I have found quite helpful in combating intolerable anal and vulvar itching. If beneficial results are to be secured, however, it should be used in the proportion of at least 1 part to 4 of the ointment vehicle.

Tar, in the form of liquor carbonis detergens, or Duhring's compound tincture of coal tar, is a valuable antipruritic, and aqueous or ethereal solutions of silver nitrate, in strengths of from 5. to 10 per cent. are also effective remedies for the relief of itching, although their field of usefulness is of course somewhat limited.

Keratolytics.—Keratolytics are agents which are capable of dis-

solving the horny layers of the epidermis. The commonest examples are salicylic acid and the alkalies (particularly potassium and sodium hydrate). The keratolytic action of soaps is due to the free alkali they contain. Remedies of this class find their greatest usefulness in hyperkeratotic conditions, such as ichthyosis, chronic eczema, and keratosis palmaris et plantaris.

Reducing Substances.—Unna classifies as reducing agents certain substances which are believed to possess the power of abstracting oxygen from the tissues. Therapeutically, such remedies exert a two-fold action. They hasten keratinization on the surface, and, by their effect on the endothelial lining of the capillaries, diminish the caliber of the vessels, and diminish the supply of blood to the part. As examples of the milder reducing agents, Unna has selected sulphur, ichthyol and the mercurial preparations, while the more powerful are represented by tar, chrysarobin and pyrogallic acid.

Mechanical and Physical Agents.

Carbon Dioxide Snow.—As early as 1900, Dethlefsen suggested congelation by means of the ethyl chloride spray as a remedy in the treatment of cutaneous disorders, and at about the same time Dade began his pioneer experiments along the same line with liquid air. Five years later, Juliusberg introduced carbon dioxide gas as a therapeutic agent. All three of these methods possessed merit, but each had some drawback which prevented its general adoption. Ethyl chloride is a comparatively mild refrigerant, and a reaction sufficient to destroy tissue cannot be secured by its use. In addition, it is quite expensive. Liquid air, which is applied by means of cotton swabs, is very effective, possessing a temperature below minus 180° C. It is obtainable in only a few localities, however, and owing to the difficulties encountered in transporting it, will probably never enjoy wide popularity as a therapeutic agent. Carbon dioxide gas, on the other hand, is effective, inexpensive, and is procurable in all parts of the civilized world. Unfortunately, as employed by Juliusberg, in the form of a spray, its use was occasionally attended by excitement and even disaster. The localization and degree of refrigeration were under very poor control, and the majority of the earlier experimenters gave up the method in despair.

In 1907, Pusey introduced the use of solidified carbon dioxide. This method retained all the virtues and did away with all of the faults of the other three, and its value and practicability were at once

apparent. Next to the Röntgen rays and radium, it is one of the most valuable physical agents employed in dermatology. The carbon dioxide of commerce is transported and kept in heavy, steel cylinders about 20 cm. in diameter and 1.5 m. in length. Each of these containers is equipped with a screw valve, and a lead safety plug. The gas is used in soda and beer fountains, and is inexpensive. It is placed in the tanks under heavy pressure, sufficiently so to cause it to assume a liquid form. When allowed to escape into the open air it forms fine, snowy particles which can be collected and handled much as one can handle snow. At this stage its temperature is about minus 90° C. The substance evaporates quite slowly, and when packed into a hard mass can be kept for an hour or more. Stelwagon has suggested the use of the ordinary automobile tire bottles when small amounts of the gas are to be transported to some distance. In addition to the liquefied carbon dioxide, each tank also contains a small amount of free gas, and in order to secure the most satisfactory results the tank should be placed on a "saw-buck" platform, with the closed end elevated a foot or more. In my own practice, a double platform, or holder, of this type is employed, and a spare, full tank is always kept on hand. In order to collect the "snow" a large piece of chamois skin is wrapped loosely about the vent, and the valve loosened. When a sufficient amount is secured, the valve is closed and the collected snow is transferred, by means of an ordinary teaspoon, to molds of various sizes. Pusey originally employed sections of hard rubber tubing, ranging from about 1.0 cm. to 6.0 cm. in diameter, and 6.0 cm. in length, for this purpose. A dozen or more designs have since been suggested, some of which are quite intricate and expensive. Personally, I have found a series of German silver or heavy tin tubes, similar in size to those used by Pusey, but having a broad flanged, or funnel-shaped top, ideal for this purpose. The set of tubes is arranged in a frame, and the snow is tamped in by means of a small round stick. In Low's mold the openings are square instead of round, and the shape of the resulting stick is more suitable for its application to many lesions, particularly if they be of considerable extent. Complicated apparatus for molding carbon dioxide snow is expensive, and is of no more value than these simple appliances.

The tip of the cylinder is whittled down to the required size, and applied to the lesion for periods of from ten seconds to two minutes. The amount of pressure to be exerted varies with the nature of the growth to be attacked. The degree of freezing is entirely dependent

upon these two factors. The temperature of carbon dioxide snow is not appreciably diminished by mixing it with or immersing it in ether, alcohol or similar chemicals before applying it to the skin. The therapeutic effect can be greatly augmented, however, by preliminary Röntgenization. Carbon dioxide snow is a valuable agent in the treatment of lupus erythematosus, certain types of nævi, seborrheic keratoses, verrucæ, and a number of other cutaneous disorders.

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Actinotherapy.—Freund summarizes the action of light as follows: It irritates the skin and produces inflammation; it acts directly on the blood and the blood vessels; with intense exposure over wide areas it attracts great quantities of blood to the surface and empties deep organs; it induces an escape of sweat; it modifies metabolism; it exerts an antiparasitic power; and in overdoses it may produce serious disturbance. Its effect is largely dependent upon the character of its constituent rays. If these be from the lower end of the spectrum, yellow or red, slow and of long wave length, the skin is but little affected, but if the shorter wave lengths, of high frequency (the violet and ultra-violet) at the opposite end of the spectrum, be included, the stimulation may be so great that tissue destruction results. It is for this reason that one is more apt to become sunburned on a clear, bright day than on a misty or foggy one. The moisture in the air filters out practically all of the short, non-penetrating, irritant rays, and only those from the lower end of the spectrum reach the earth. The same thing occurs in incandescent lamps fitted with lead glass globes. Much of our present knowledge of actinotherapy we owe to Finsen, of Copenhagen. He employed it first in the treatment of lupus vulgaris. In order to secure the actinic effect of the less penetrating rays, he employed lenses of rock crystal, a substance which allows the passage of rays of infinitely short wave lengths. As a precaution against overheating, two lenses were so arranged in a focusing tube that a stream of cold water constantly passed between them, and absorbed practically all of the heat rays. The outer lens was pressed tightly against the area to be treated, in order to render it as anemic as possible, for even a thin layer of blood will completely absorb the

light waves and prevent further penetration. Sunlight was employed at first, but at this time giant arc lamps, with carbon or hollow iron electrodes, are used. The duration and frequency of the exposures vary with the nature and extent of the lesion. In superficial conditions an exposure of from twenty to forty-five minutes is made. In deeply seated disorders, the length of exposure varies from one to two hours. The reaction occurs in from eight to twenty-four hours, and subsides in the course of a fortnight. The treatment is not repeated until the acute inflammation dies down. In properly treated cases, the cosmetic results are excellent, but the method is a very slow and tedious one, months or even years often being required to heal the lesions in an ordinary case of lupus vulgaris. Röntgen therapy is far speedier, and just as effective, although the ultimate cosmetic effect is less pleasing. The results of Verhoeff's recent experiments would indicate that the penetrative powers of the ultra rays is so slight that they possess slight, if any, bactericidal power in any but surface lesions. Kromayer has invented a quartz vapor lamp which gives excellent results in alopecia areata, acne vulgaris, and a certain percentage of cases of lupus erythematosus. By means of quartz compressors, sufficient tissue destruction can be secured to eradicate angiomata and similar growths. The cosmetic results usually are good. The Alpine Sun Lamp, which is also a quartz vapor lamp, is much less cumbersome than the Kromayer instrument, and in my hands has proved very satisfactory in the treatment of acne and other sluggish dermatoses. I have obtained satisfactory results from the use of high power incandescent lamps (500 to 1,000 C.P.) in impetigo contagiosa and similar disorders.

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Röntgen Therapy.—The Röntgen rays in therapeutic doses produce definite degenerative changes in all of the cutaneous tissues. Their effect is apparently in direct proportion to the complexity of the involved structures. The epidermis, with its contiguous glands, is the first organ to exhibit appreciable changes. Localized pigmentation and asteatosis are comparatively common conditions in persons who have been subjected to treatment for considerable periods. If the dose is pushed beyond a certain point, an erythema, or superficial

dermatitis, not unlike sunburn, develops. The untoward results vary from this slight reactionary manifestation up to actual necrosis of the skin.

The effect of the Röntgen rays upon living tissues and upon bacteria may be summarized as follows (Pusey):

Although not directly parasiticidal, they have a destructive effect upon microorganisms in living tissues. In therapeutic doses they stimulate and in over doses they disorganize and destroy cells, largely through their peculiar effect upon nutrition. This distinctive action upon living cells is selective, in that certain diseased or injured cells break down before the healthy elements are seriously affected. In certain pruritic conditions of the skin they exert an anodyne effect. If their use is long continued, atrophy of the cutaneous appendages results. In the therapeutic application of the Röntgen rays it is essential that the desired result be attained without undue exposure to injury of either the patient or the operator. The structures surrounding the lesion to be treated should be covered with heavy lead foil, and in addition to the thick lead glass tube protectors commonly employed, a metal screen should be used to further guard the operator from stray rays. We do not yet fully appreciate the dangers of long continued exposure to this mysterious agent, although the condition of the hands of many of our pioneer operators should convince us that we are meddling with a force which may be of great power for evil, as well as for good.

During the past decade frequent attempts have been made to establish a dosage standard in Röntgen therapy. For the most part these measuring appliances, or radiometers, are dependent upon the color changes which occur in certain substances as a result of exposure to the rays. The material commonly employed is barium platinocyanide. Probably the most popular of these measuring instruments is the Kienböck, although the old Sabouraud-Noiré pastilles, the Holzknecht, and the Bordier chromoradiometers have their advocates. For some unknown reason these appliances, which are standard in the several European countries, have proved less trustworthy in America, and at present are but little beyond the experimental stage. MacKee, E. H. Skinner, Pfahler and others have done much to popularize their use. It is probably only a question of time until some dependable method will be generally adopted. Theoretically, accurate dosage strongly appeals to everyone, but few of us care to desert a method which gives results and which we know to be com-

paratively safe, for something which may get us into trouble. I have seen serious burns following the incorrect use of a supposedly reliable radiometer.

In the past few years a great deal of experimental work has been done in an endeavor to secure tubes which were adequate to the duties imposed upon them. The Coolidge tube, which is of the electron variety, with a tungsten anode, and a filamentous cathode which is connected to two currents, the usual high potential and a second, of low potential, obtained either from a storage battery or a down-step transformer, and which serves to regulate the vacuum of the tube, is one of the greatest advances in radiotherapeutic technic in recent years. The tubes are durable as well as efficient, and while their first cost is greater than that of an ordinary tube, their simplicity, reliability, and greater penetrative power more than make up for the added expenditure.

Owing to the fact that the Holzknecht radiometer is practically unobtainable, because of the European war conditions, the Corbett radiometer is being extensively employed in this country. MacKee, who has had wide experience in the use of all kinds of accurate measuring apparatus, speaks very highly of this instrument, and it is probable that it will replace the more complicated methods formerly employed in many laboratories.

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Radium and Mesothorium.—During the past few years much experimental work has been done with radium in the treatment of cutaneous lesions. Wickham and Degrais, in France, and Simpson and others in this country have reported very encouraging results following its application in angiomata, particularly of the port-wine-stain type, keloid, tuberculosis of the mucous membranes, hypertrichosis, and certain types of carcinomata.

The bromide (soluble) and the sulphate (insoluble) are the salts commonly employed. In a general way the effect of radium is somewhat similar to that of the Röntgen rays, and the therapeutic indications are much the same. Radium gives off both emanations and rays. The former are soluble in water, which they render radioactive. The latter are of three varieties, which have been designated as the Alpha,

Beta and Gamma rays. The Alpha rays are the least penetrating, and are stopped by an aluminum screen .01 mm. in thickness. The Beta are next so, and a lead screen 5.0 mm. in thickness is required to stop them, while the Gamma rays are very penetrating, and will pass through a lead screen 10.0 cm. in thickness. For therapeutic purposes, aluminum or lead screens are employed and only the Beta and Gamma rays used. Radium is applied to the skin in three ways, by means of capsules (usually of glass, surrounded by a platinum or silver envelope), disks or plaques (to which radium sulphate is attached by means of a varnish), and small squares of linen or similar material

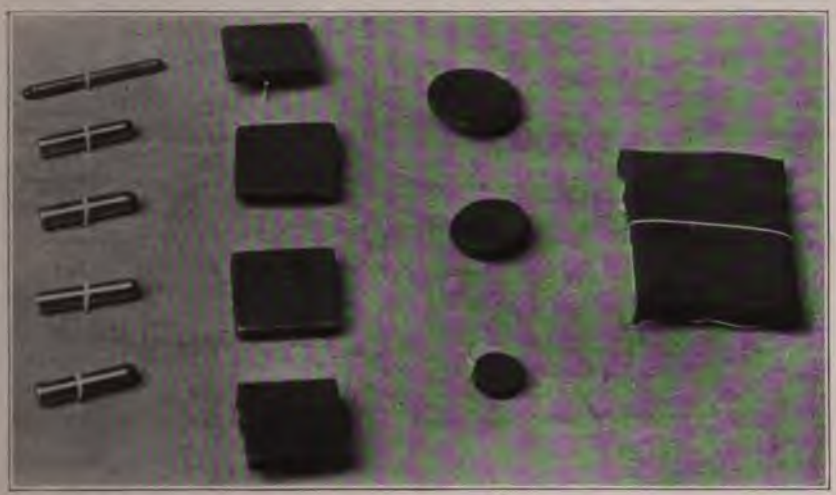

Fig. 15.—Types of radium apparatus. (Courtesy of Dr. Frank Edward Simpson.)

("toiles"), which are somewhat flexible but quite friable. In the treatment of ordinary skin lesions from 10.0 to 20.0 mgms. of radium are usually sufficient. The agent is applied daily for one to three hours, over a period of five or six days. Radium possesses one great advantage over the Röntgen rays, in that it can be placed in the throat and similar cavities, and brought into direct contact with diseased tissues in these localities. Unfortunately, radium is an exceedingly expensive substance. Recently a new radioactive substance, known as mesothorium, has been introduced. While considerably less active than radium, and comparatively short-lived, it costs only about one-fourth as much, and promises to prove a valuable addition to our present armamentarium.

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High-Frequency and Fulguration Currents.—High-frequency currents are currents of very high potential (high voltage and comparatively low amperage), obtained by means of a Piffard transformer, a Rhumkorff or similar coil, fitted with a rapid interrupter, or an Oudin resonator attached to an induction coil. High-frequency currents are applied to the skin by means of vacuum electrodes. The resulting effluvia are supposed to have a mildly stimulating effect upon the tissues exposed to its action. The word "fulguration," suggested by Pozzi and popularized by de Keating-Hart, has no definite meaning. The designation "high-frequency caustic spark" (Piffard) is far more appropriate, although a trifle clumsy. Both refer to the same thing, the local application of a spark by means of an insulated pointed metal electrode. The method is a fairly effective, but somewhat painful one, in the destruction of small cutaneous growths. De Keating-Hart has recommended its application in large malignant growths, both before and after operation, and believes that it has a selective action on cancerous tissue.

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HIGH-FREQUENCY AND FULGURATION CURRENTS.—*MacKee*, Jour. Cutan. Dis., 1909, p. 245. — *de Keating-Hart*, Arch. d. Electricite med., May 25, 1908.

Cataphoresis and Electrolysis.—When the poles of a galvanic battery are brought in contact with moist animal tissue the current continues to pass from the positive to the negative pole provided the resistance is not so great as to overcome it. Soluble drugs can be introduced into, and through, the skin in this manner. The positive sponge is moistened with the desired solution, the circuit closed and sufficient current (from 3.0 to 10.0 m. amp.) turned on to overcome the resistance of the intervening tissues. Cocaine and other drugs can be employed in this manner, but care must be taken to guard against overdosage. The method has been suggested for the treatment of ringworm of the scalp and similar disorders (various antiseptics being used), but while the idea is theoretically a fascinating one it has not proven practically successful. If, instead of sponge

electrodes, needles are substituted, more or less tissue destruction occurs at the point of contact. As a result of the decomposition, acids are formed at the positive pole and alkalies at the negative pole. This process is called decomposition by electrolysis. The method is frequently employed in the destruction of dilated capillaries and various small growths, and is particularly valuable in getting rid of the papillae of superfluous hairs. Its introduction into the latter field we owe to Michel and Hardaway, of St. Louis. For practical purposes, one needle and one sponge electrode are used. Owing to the fact that oxidation occurs at the positive (acid) terminus, the needle should be connected with the negative pole. In this way pigmentation with particles of metal is avoided. Fortunately, the tissue destruction also is much greater at this pole. Various needles have been recommended. Those of iridioplatinum are expensive, jeweler's broaches are clumsy and stiff, and small gauge platinum wire is either too large for the purpose, or, if ground down, too limber to be very satisfactory. The smallest size cambric needles answer admirably, and are easily secured and very inexpensive. The hard rubber holders can be procured of any instrument house. The source of current varies. The ordinary galvanic wall plate is best. If commercial current is not available, a five to ten cell bichromate battery may be used. A milliampere meter should always be attached. From 2.0 to 8.0 m. amp. of current are generally required. In the removal of growths located on the more sensitive areas it is well to employ a local anesthetic (novocaine, with adrenalin, is excellent). This procedure requires but a moment, and is always appreciated by the patient. After removal, the area treated should be painted with tincture of iodine, and dithymol diodide applied. The lesions generally heal promptly and without incident.

CLASSIFICATION.

The main object of classification is to show the pathological relationship of diseases to each other. Unfortunately, our knowledge of the histopathology of a considerable number of cutaneous disorders is as yet very incomplete, and many years of investigation will probably be required before an accurate and complete arrangement on a strictly pathologic basis can be made. Of the many classifications suggested, those of Auspitz, Hebra, Unna, Crocker, Bronson and Jadassohn are probably the most popular. Personally I believe Crocker's plan, which is a slightly modified form of the one first suggested by Hebra, to be the most comprehensive and satisfactory, and it furnishes the basis of the classification here presented.

CLASS I.—HYPEREMIAS.

	Predominant Clinical Manifestations.	*Etiology.*
Erythema hyperemicum.	Erythema.	Vasomotor disturbances.
Erythema intertrigo.	Erythema, with exudation of fluid.	Probably microbic.
Erythema scarlatinoides.	Erythema.	Probably toxic.

CLASS II.—INFLAMMATIONS.

Erythema multiforme.	Erythema, with or without papule and bulla formation.	Probably toxic.
Erythema perstans.	Erythema.	Probably toxic.
Erythema nodosum.	Erythematous nodules.	Probably microbic.
Urticaria.	Transient wheals.	Toxic.
Urticaria pigmentosa.	Persistent wheals.	Cause unknown. Mast cells in corium.
Edema angioneuroticum.	Localized edematous areas.	Toxic. Vasomotor disturbances.
Dermatitis exfoliativa.	Erythema.	Toxic. May follow eczema, psoriasis and other disorders.
Dermatitis exfoliativa epidemica.	Erythema.	Probably microbic.
Keratolysis.	Erythema.	Unknown.
Pellagra.	Erythema.	Unknown.

CLASS II.—INFLAMMATIONS.—(Continued.)

Granuloma annulare.	Flat papules.	Unknown.
Prurigo.	Papules.	Unknown. (Neurosis?)
Lichen chronicus simplex.	Exaggerated surface wastings.	Neurosis.
Prurigo nodularis.	Nodules.	Neurosis.
Lichen planus.	Small, angular papules.	Probably microbic.
Lichen nitidus.	Flesh-colored papules.	Unknown.
Chronic resistant macular and maculopapular scaly erythrodermias.	Erythema, papules or scales.	Unknown.
Pityriasis rubra pilaris.	Diffuse redness.	Unknown.
Psoriasis.	Scaly papules.	Unknown.
Pityriasis rosea.	Circinate lesions with fine scales.	Unknown.
Dermatitis seborrheica	Erythema, with formation of greasy scales.	Probably microbic.
Eczema.	Multiform lesions.	Unknown.
Infectious eczematoid dermatitis.	Vesicles and pustules.	Microbic. (Probably staphylococcus pyogenes aureus.)
Dermatitis repens.	Deep-seated pustules.	Staphylococcus pyogenes aureus.
Herpes simplex.	Vesicles.	Toxic.
Herpes zoster.	Vesicles.	Microbic.
Pompholyx.	Deep-seated vesicles.	Unknown.
Dermatitis herpetiformis.	Erythematous or vesicular lesions.	Unknown.
Impetigo herpetiformis.	Pustules.	Unknown. Probably toxic.
Pemphigus.	Vesicles and bullæ.	Unknown.
Dermatitis vegetans.	Vegetations on eczematous base.	Probably microbic.
Epidermidolysis bullosa.	Vesicles and bullæ.	Congenital or acquired defect.
Impetigo contagiosa.	Vesicles.	Staphylococcus or streptococcus.
Furunculus.	Pustules.	Staphylococcus pyogenes aureus.
Carbunculus.	Pustules.	Staphylococcus pyogenes aureus.
Equinia.	Multiform lesions (usually vesicopustular.)	Bacillus mallei.
Pustula maligna.	Pustules.	Bacillus anthracis.
Erysipelas.	Erythema.	Streptococcus of Fehleisen.

CLASS II.—INFLAMMATIONS.—(Concluded.)

Erythema migrans.	Erythema.	Unknown.
Sphaceloderma.	Varies.	Exciting cause possibly microbic.
Vaccinal eruptions.	Vesicles.	Unknown. (Probably anaphylactic.)

CLASS III.—HEMORRHAGES.

Purpura simplex.	Blood extravasation.	Toxic.
Purpura rheumatica.	Blood extravasation.	Probably microbic.
Henoch's purpura.	Blood extravasation.	Probably microbic.
Purpura hemorrhagica.	Blood extravasation.	Probably microbic.

CLASS IV.—HYPERTROPHIES.

	Involved Structures.	*Etiology.*
Ichthyosis.	Epidermis and papillae.	Congenital.
Ichthyosis hystrix.	Epidermis and papillae.	Congenital.
Acanthosis nigricans.	Epidermis and corium.	Unknown.
Clavus.	Epidermis and papillae.	Local irritation.
Callositas.	Epidermis and papillae.	Friction.
Keratosis palmaris et plantaris hereditaria.	Epidermis.	Usually congenital.
Keratosis gonorrheica.	Epidermis principally.	Gonococcus.
Cornu cutaneum.	Epidermis and papillae.	Unknown.
Keratosis pilaris.	Follicles.	Usually congenital.
Lichen spinulosus.	Follicles.	Unknown.
Keratosis follicularis	Follicles.	Possibly microbic.
Keratosis follicularis contagiosa.	Follicles.	Possibly microbic.
Verruca.	Epidermis and papillae.	Possibly microbic.
Keratosis seborrheica.	Epidermis and papillae.	Unknown.
Porokeratosis.	Epidermis.	Unknown.
Scleroderma.	Corium.	Unknown. (Probably due to an endarteritis, which may result from any one of several causes.)
Sclerema neonatorum.	Corium.	Unknown.
Elephantiasis.	Epidermis and cutis.	Obstructive lymphangitis. (May follow infection with filaria.)
Myxedema.	Thickening and induration of all layers.	Thyroid insufficiency.
Dermatolysis.	Subcutaneous structures mainly.	May be congenital.

CLASS V.—ATROPHIES.

	Structures Involved.	*Etiology.*
Atrophia senilis.	Corium.	Old age.
Glossy skin.	All layers involved.	Probably trophic.
Kraurosis vulvae.	All layers involved.	Unknown.
Xeroderma pigmentosum.	All layers involved.	Unknown.
Striæ et maculæ atrophicæ.	All layers involved.	Due to stretching, in some instances. Trophoneurotic (?) in others.
Diffuse idiopathic atrophy.	All layers involved.	Unknown.
Ainhum.	Epidermis and corium.	Unknown.
Perforating ulcer.	All layers involved.	Supposedly trophoneurotic.
Syringomyelia.	All layers involved.	Diseases of central nervous system.

CLASS VI.—ANOMALIES OF PIGMENTATION.

	Structures Involved.	*Etiology.*
Lentigo.	Epidermis.	Commonly due to actinic or other irritation.
Lentigo senilis.	Epidermis.	Unknown.
Chloasma.	Epidermis.	Toxic (?).
Argyria.	Corium.	Long continued ingestion of silver salts.
Tattoo marks.	Corium.	Artificial.
Albinismus.	Epidermis.	Congenital.
Leucoderma.	Epidermis.	Probably trophic.

CLASS VII.—NEUROSES.

Hyperesthesia.
Dermatalgia.
Erythromelalgia.
Pruritus.
Anesthesia.

CLASS VIII.—NEW GROWTHS.

	Structures Involved.	*Etiology.*
Molluscum contagiosum.	Epidermis.	Probably microbic.
Xanthoma.	Corium.	Unknown.
Xanthoma diabeticorum.	Corium.	Patients usually diabetic.

CLASS VIII.—NEW GROWTHS.—(Continued.)

Colloid degeneration of the skin.	Corium.	Unknown.
Dermolysis.	Corium.	Unknown.
Benign New Growths.	***Character of Lesion.***	***Etiology.***
Cicatrix.	Fibrous.	Unknown.
Keloid.	Fibrous.	Unknown.
Nævus pigmentosus.	Epidermis.	Embryonic.
Fibroma.	Collagenous.	Unknown. (May develop as result of some toxin, as in fibroma molluscum gravidarum.)
Paraffinoma.	Fibrocellular.	Foreign body irritation.
Neuroma.	Fibrous growth of nerve sheath.	Unknown. (May develop as a result of irritation, as in limb stumps.)
Lipoma.	Adipose.	Unknown.
Myoma.	Muscular.	Unknown.
Osteitis cutis.	Bony.	Unknown.
Tumors of the Blood Vessels.		
Nevus vascularis.	Blood vessels.	Embryonic.
Telangiectasis.	Blood vessels.	Embryonic or acquired.
Generalized telangiectasis.	Blood vessels.	Probably toxic.
Angioma serpiginosum.	Blood vessels.	Unknown. (Possibly microbic.)
Tumors of the Lymphatics.		
Lymphangioma.	Lymph vessels.	May result from injury, filarial infection or unknown causes.
Lymphangioma circumscriptum.	Lymph vessels.	Unknown.
Benign or Epithelial Tumors.	***Character of Lesions.***	***Etiology.***
Acanthoma adenoides cysticum.	Epithelial, from epidermis.	Unknown.
Adenoma sebaceum.	Sebaceous.	Unknown.
Syringocystadenoma.	Probably epithelium from coil gland ducts.	Unknown.
Sarcoid.	Cellular.	Probably microbic.

CLASS VIII.—NEW GROWTHS.—(Continued.)

Malignant New Growths.		
Carcinoma cutis.	Epithelial, from epidermis.	Unknown.
Paget's disease of the nipple.	Epithelial, from epidermis.	Unknown.
Primary pigmented carcinoma of the skin.	Epithelial, from epidermis.	Unknown.
Sarcoma cutis.	Connective tissue.	Unknown.
Idiopathic multiple hemorrhagic sarcoma of the skin.	Connective tissue.	Unknown.
Leukemia cutis.	Cellular infiltration in corium.	Occurs in generalized leukemia.
Granuloma fungoides.	Cellular infiltration in corium.	Unknown.
New Growths of Infectious Origin.		
Granuloma pyogenicum.	Connective tissue, highly vascular.	Staphylococcus pyogenes aureus.
Rhinoscleroma.	Corium.	Microbic.
Tuberculosis of the Skin.		
Tuberculosis verrucosa cutis.	Nodules and warty lesions.	Tuberculous.
Lupus vulgaris.	Nodules.	Tuberculous.
Scrofuloderma.	Suppurating glands with sinuses.	Tuberculous.
Verruca necrogenica.	Warty lesions.	Tuberculous.
Tuberculides.	Minute nodules.	Due to tuberculous toxins.
Syphilis.	Early inflammatory, later infiltrating.	Spirocheta pallida.
Frambesia.	Granuloma.	Undoubtedly microbic.
Gangosa.	Ulcerative.	Unknown.
Lepra.	Early inflammatory, later infiltrating.	Bacillus lepra.
Oriental sore.	Papular.	Microbic.
Verruga peruana.	Granuloma.	Microbic.
Granuloma inguinale tropicum.	Granuloma.	Probably mixed microbic.
Chancroid.	Early inflammatory, later ulcerative.	Ducrey-Unna bacillus.

CLASS IX.—DISEASES OF THE APPENDAGES.

1. Diseases of the Hair and Hair Follicles.	*Predominant Clinical Manifestations.*	*Etiology.*
Hypertrichosis.	Excessive hairiness.	Unknown.
Plica neuropathica.	Matted hair.	Unknown.
Atrophia pilorum propria.	Alterations in shaft of hair.	Trophoneurosis (?).
Lepothrix.	Concretions on shaft.	Microbic.
Chignon.	Concretions on shaft.	Microbic.
Tinea nodosum.	Concretions on shaft.	Microbic.
Canities.	Loss of color.	Trophoneurosis (?)
Alopecia.		
Trichotillomania.	Depilated areas.	Neurosis.
Alopecia areata.	Bald areas.	Microbic or neurotic.
Folliculitis decalvans.	Bald areas, cicatricial.	Microbic.
Dermatitis papillaris capillitii.	Small, keloidal lesions on back of neck.	Microbic.
Sycosis vulgaris.	Folliculitis of bearded region.	Microbic.
2. Diseases of the Sebaceous Glands.		
Seborrhea.	Excessive secretion.	Microbic.
Asteatosis.	Deficient secretion.	Unknown.
Steatoma.	Cystic tumor.	Retention cysts.
Milium.	White papules.	Due to retention.
Congenital milium in plaques.	Grouped white papules.	Congenital.
Comedo.	Black papules.	Probably microbic.
Acne vulgaris.	Pustules.	Probably acne bacillus, plus staphylococcus.
Acne rosacea.	Pustules and hyperemia.	Reflex congestion plus bacillus acnes.
Acne varioliformis.	Necrotic pustules.	Probably staphylococcus.
3. Diseases of the Coil Glands.		
Hyperidrosis.	Excessive sweating.	Neurosis.
Anidrosis.	Absent sweating.	Unknown.
Bromidrosis.	Sweat with foul odor.	Probably neurotic plus bacterium fœtidum.
Chromidrosis.	Colored sweat.	Unknown.
Pseudochromidrosis.	Colored sweat.	Parasitic.
Phosphoridrosis.	Phosphorescent sweat.	Unknown.
Uridrosis.	Sweat of urinous odor.	Sometimes occurs in uremia and other diseased conditions.

CLASS IX.—DISEASES OF THE APPENDAGES.— (Concluded.)

Sudamen.	Minute, translucent vesicles.	Retained secretions.
Miliaria.	Minute papules and vesico-papules.	Excessive sweating with retained secretions.
Granulosis rubra nasi.	Red and brownish-red papules on tip of nose.	Unknown.

4. Diseases of the Nails.

Onychauxis.	Ungueal hypertrophy.	Varies.
Onychomycosis.	Fungus growth in nail.	Parasitic.
Atrophy of the nails.		Trophoneurosis.
Congenital atrophy of the nails.		Congenital.
Eggshell nails.	Thin, up-curved nails.	Peripheral vascular disturbances.
Transverse furrowing of the nails.		Trophoneurosis.
Onychia.	Inflammation of matrix.	Varies. Usually microbic.
Leuconychia.	White spots or bands on nails.	Varies. May be traumatic.

CLASS X.—PARASITIC AFFECTIONS.

1. Diseases Due to Animal Parasites.		*Etiology.*
Pediculosis.		Louse.
Pulex irritans.		Flea.
Cimex lectularius.		Bedbug.
Grain itch.		Pediculoides ventricosus.
Creeping eruption.		Larva of gastrophilus.
Pulex penetrans.		Chigoe.
Leptus autumnalis.		Harvest bug.
Filaria medinensis.		Guinea worm.

2. Diseases Due to Fungi.	*Parts Affected.*	*Etiology.*
Tinea trichophytina	Corporis. Cruris. Capitis. Barbæ.	Ringworm fungus.
Favus.	Hair, skin and nails.	Achorion schoenleinii.
Tinea versicolor.	Epidermis.	Microsporon furfur.
Erythrasma.	Epidermis.	Microsporon minutissimum.
Pinta.	Epidermis.	Parasitic.
Myringomycosis.	External auditory canal.	Myringomycosis aspergillina.

CLASS X.—PARASITIC AFFECTIONS.—(Concluded.)

Blastomycosis.	Skin and deeper tissues.	Blastomyces.
Sporotrichosis.	Skin and deeper tissues.	Sporotrichium schenkii.
Actinomycosis.	Skin and deeper tissues.	Ray fungus.
Mycetoma.	Skin and deeper structures of feet and hands.	Parasitic.

CLASS XI.—DISEASES OF THE MUCOUS MEMBRANES.

	Parts Affected.	*Etiology.*
Leukoplakia.	Tongue.	Varies. Syphilis, chronic irritation, etc.
Black tongue.	Dorsum of tongue.	Unknown.
Furrowed tongue.	Dorsum of tongue.	Unknown.
Transitory benign plaque of the tongue.	Dorsum and sides of the tongue.	Unknown.
Periadenitis mucosa necrotica recurrens.	Tongue and mucous surfaces of lips.	Unknown.
Cheilitis exfoliativa.	Lips.	Unknown.
Fordyce's disease.	Mucous surfaces, lips and cheeks.	Congenital.

CLASS I.—HYPEREMIAS.

It is difficult to draw a sharp line of demarcation between the active, non-inflammatory hyperemias and those which are accompanied by slight inflammatory and exudative changes. Consequently the separation is more conventional than real. Hyperemia may be active or passive, the former being synonymous with erythema, the latter with venous stasis.

ERYTHEMA HYPEREMICUM.

Synonyms.—Erythema simplex; Erythema congestivum.

Erythema hyperemicum is a congestive disorder of the skin, characterized by the occurrence of non-elevated, erythematous lesions of various shapes and sizes. Erythema hyperemicum may be idiopathic or symptomatic. Generally speaking, the idiopathic erythemata are due to the action of certain external agencies, such as heat, cold, and various mechanical and chemical irritants, while symptomatic erythemata develop as a result of some internal, or systemic, cause. Pusey holds that the usual members of the so-called idiopathic group are in reality varieties of dermatitis, and that the true idiopathic erythemata are invariably the expression of some form of intoxication. His conclusions are certainly based on sound reasoning, but the older classification will be adhered to here. The erythemata due to heat and to cold (erythema from caloric) are known as *erythema caloricum* and *erythema pernio* (chilblains), respectively. If developing as a result of exposure to the sun, the condition is called *erythema solare,* and if from the effects of artificial heat (as the long-continued application of a hot water bottle, or an electric pad) as *erythema ab igne.* In the latter condition, there is often some accompanying inflammation, and pigmentation is not infrequent. Chilblains are purplish lesions which develop on the nose, ears, heels and other prominences as a result of repeated exposure to cold. They are especially common in damp, cold climates, such as that of London, and occur frequently in persons with feeble circulation. These individuals habitually suffer

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from cold hands and feet, and in some localities are spoken of by physicians as examples of "chilblain circulation."

Erythema perstans is a chronic disorder which is characterized by

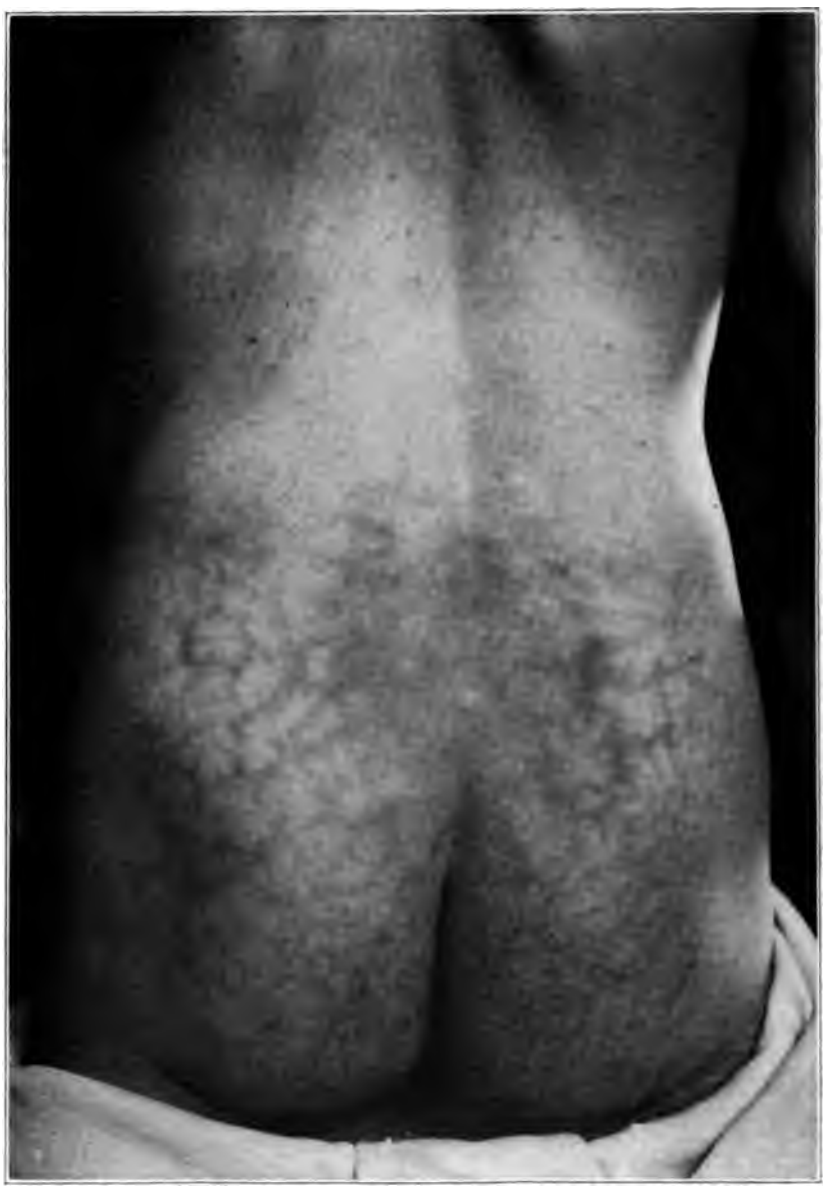

Fig. 16.—Erythema ab igne. Due to long continued use of electric pad.

the occurrence of variously sized and shaped, purplish, macular lesions on the extremities. Occasionally, there are present appreciable signs of inflammation, and the symptomatology would indicate a closer relationship to erythema multiforme than to erythema simplex. The majority of the cases that have come under my observation have occurred in "varicose" subjects, and it is probable that cardiac weakness and venous obstruction of various kinds play an important part in their causation.

Under erythema from traumatism may be grouped those examples which develop as a result of slight wounds or similar injuries, as well as from the pressure and rubbing excited by ill-fitting trusses, etc. The erythemata produced by the action of various mineral and vegetable poisons, such as sulphur, the alkalies, mustard, cantharides, pyrogallic acid, rhus, and certain other plants, may be conveniently grouped under the general heading of *erythema venenatum.*

Under the symptomatic erythemata may be placed the congestive disorders of the skin which develop as a result of systemic disease, or from some general derangement of the economy. Aside from syphilis and the acute exanthemata, anaphylaxis is probably the most common cause of eruptions of this type. The introduction into the body of foreign proteid of various sorts, but particularly in the form of sera, frequently gives rise to symptomatic roseola. Various other medicinal agents occasionally give rise to localized or generalized symptoms. These will be discussed under dermatitis medicamentosa. In erythemata of the symptomatic type the eruption varies in amount and distribution, but is usually symmetrical. The color is pink, red or dark red. In the majority of instances there is little or no itching, although there may be a sensation of warmth, or even burning. There is seldom any scaling, and on regression the lesions leave no trace.

Diagnosis.—In the majority of cases of idiopathic erythemata the diagnosis is made by the patient himself. In some examples of erythema perstans the lesions may bear a superficial resemblance to those of purpura, but the history is usually distinctive. In the symptomatic group, it is sometimes impossible to unearth the exact cause, although the character of the eruption is generally distinctive of the nature of the condition. The acute exanthemata are readily differentiated by the concomitant constitutional symptoms.

Treatment.—The treatment is largely dependent upon the etiology. In the idiopathic disorders, the removal of the exciting cause is often

sufficient. The frequent application of a soothing, cooling, protective mixture, like calamin lotion:

℞ Phenolis ..... gr. xv (1.0)
Zinci oxidi,
Amyli pulveris,
Calaminæ ..... āā 3 v (20.0)
Glycerini ..... 3 iiss (10.0)
Aquæ ..... q. s. ad f℥ vi (180.0)
Misce, Signa.

is beneficial at times. In the earlier stages of chilblain, soothing local applications, such as calamine lotion, alternated with a modified zinc oil; such as

℞ Phenolis,
Mentholis ..... āā gr. v (0.3)
Unguenti zinci oxidi,
Adipis lanæ ..... āā 3 iv (15.0)
Liquoris calcis, q. s. ad saturationem.
Misce fiat unguentum; Signa: Apply night and morning.

may be prescribed. Tonics, particularly strychnia in moderate doses, also are indicated. Later, when the disorder has assumed a chronic stage, stimulating remedies, such as Balsam of peru, oil of turpentine, oil of tar (10 per cent in ointment), and ichthyol (25 to 30 per cent in ointment or solution) are required.

In the symptomatic erythemata the removal of the exciting cause, when possible, is, of course, a cardinal indication. The bowels should be kept freely open by means of salines or one of the cascara preparations, and the kidneys well flushed. Locally, calamine lotion, or a daily massage with olive oil (to which 0.5 to 1.0 per cent of phenol or menthol, or both, has been added) may be employed.

ERYTHEMA FIGURATUM PERSTANS

In 1905, and again in 1908, Wende described a chronic type of erythema which was characterized by the occurrence of "persistent erythematous patches, which assume annular, marginate, and gyrate forms, differing essentially from other varieties of erythema."

Symptoms.—The trunk is the site of predilection for the development of the lesions, which usually are at first red in color, but later assume a purplish or violaceous hue. They finally disappear, leaving a brownish, pigmented patch, which may be uniform, but often is stippled

or reticulated. The duration of the lesion varies, but many persist for weeks or even months before undergoing involution. Recently Wise, Mook, and MacKee and Wise have reported typical examples of the condition. It is probable that Abramowitz's cases came in the same category.

In a pea-sized lesion, Wise found: "The striking feature of the section was the paucity of the pathological alterations manifested in what appeared to be an actively evoluting, distinctively indurated lesion. The induration, instead of being due to a cellular infiltration as was anticipated, evidently was the result of the intense edema of the connective tissue of the skin.

"In a general way, the microscopic changes differed hardly at all from those existing in ordinary types of multiform erythema in its maculopapular stages. The epidermis was moderately hyperkeratotic, the rete cells somewhat swollen and edematous; the palisade cells were destroyed by the edema and pressure of the underlying connective tissue, and the basal membrane was nowhere visible, the rete cells resting directly upon the papillary bodies. The latter were quite edematous but not markedly changed in shape or size; the blood and lymph vessels within the papillæ were markedly dilated; a scattered, irregular infiltration of lymphocytic cells obtained in some few of these papillæ, some of the cellular elements invading the malpighian layer of the epidermis. The deeper portions of the corium presented several widely scattered areas of more or less circumscribed lymphocytic cell infiltrates, most of the cell aggregations lying in close relation to the blood vessels. The latter were dilated, the walls of many of them markedly thickened; in the deeper portions of the cutis, the vascular walls were intensely edematous, its component structures showing signs of degeneration. The collagen took part in the edematous process, its bundles being swollen, lying in compact, parallel strands, giving the appearance of a greatly thickened pars reticularis. Among these strands, there were scattered, elongated cellular aggregations, composed of lymphocytes and a few connective tissue cells. The coil glands presented slight changes due to edema. Sebaceous glands were not present. Throughout the corium were seen large, dilated lymph spaces, with extravasated red blood cells here and there and occasional lakelets of blood serum."

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ERYTHEMA INTERTRIGO.

Erythema intertrigo is an acute exudative affection of the skin occurring on opposing surfaces, characterized by redness and often accompanied by more or less abrasion and maceration.

Symptoms.—Localized redness, usually accompanied by hyperidrosis, is the first manifestation. Later, if neglected, the skin becomes abraded and raw, often with the formation of vesicles and pustules. The gluteal and cruroscrotal folds, the inframammary region, and the folds of the neck are the most common locations.

Etiology.—Primarily due to friction and the presence of irritating secretions, the condition furnishes an excellent field for bacterial growth, and in neglected cases parasitic involvement is the rule, rather than the exception. The usual offending organism is the staphylococcus. The disorder is especially common in fleshy persons, and during the hot months. Children, particularly fat infants, furnish a considerable percentage of the cases. Leukorrheal, urinous and similar irritating discharges may be instrumental in its production, and diabetic subjects are particularly prone to attack. Too frequent use of soap and water, particularly if the soap be very alkaline and the water hard, is occasionally a supplementary etiologic factor.

The condition is to be differentiated from erythematous eczema and from congenital syphilis. In eczema the infiltration of the skin, the multiform character of the lesions, and the pronounced subjective symptoms generally furnish distinctive proof of the nature of the affection. Sometimes it is less easy to differentiate the erythema of congenital syphilis. If the latter disorder is suspected, search should be made for anal and perianal lesions, such as mucous patches, ulcers and condylomata. In case of doubt, a drop of exuded serum should be examined by means of a dark-field illuminator, or a Wassermann test should be made.

Treatment.—As a prophylactic measure, dirt and decomposing sweat and débris should never be allowed to accumulate in the folds of the skin. In addition to keeping the parts clean, the liberal use of a desiccating powder, such as the stearate or oleate of zinc, or a zinc oxide and starch mixture, is often advisable, particularly in fleshy persons and in babies. As a rule, ointments do not act well in these cases. If there is a tendency to suppuration, daily cleansing with a non-irritating antiseptic, such as a 1 per cent aqueous solution of lysol,

is beneficial. Afterwards, the parts are to be dried by tapping with a soft towel, and the powder freely applied. Occasionally it is necessary to separate the affected parts by means of gauze or cotton pads, or Unna's powder bags (long, narrow, quilted bags filled with a desiccating powder). If there is much oozing, the areas may be painted twice weekly with a 5 per cent aqueous solution of silver nitrate, or a solution of aluminum acetate, or lead acetate or lactate applied twice daily on compresses.

ERYTHEMA SCARLATINOIDES.

Synonyms.—Scarlatinoid erythema; Erythema scarlatiniforme; Desquamative scarlatiniform erythema; Dermatitis scarlatiniformis recidivans; Erythema scarlatinoides recidivum.

Definition.—Under the heading of erythema scarlatinoides may be grouped a number of ill-defined conditions which may result from any one of a number of causes, and which are characterized clinically by redness and desquamation.

Symptoms.—While the redness and exfoliation vary much in degree, the constitutional symptoms throughout the course of an attack are, as a rule, remarkably trivial. The eruption may be morbilliform in character, but generally resembles that of scarlet fever more than any other dermatosis. An attack of erythema scarlatinoides is generally ushered in by chilly sensations and feelings of malaise. These are followed by a rise in temperature (from 99 to 101° F.), which may persist for two or three days. The eruption develops in from twenty-four to seventy-two hours. Pinkish in color and somewhat mottled at first, it soon becomes bright red, and of more or less general distribution. The fever and other constitutional symptoms usually abate at this time. There is occasional itching and burning of a mild type, and the patient may complain of a feeling of tenseness in the skin, but the subjective symptoms are never a prominent feature of the disease.

Desquamation, commonly in the form of large, thin, translucent flakes, commences early, even while the rash is spreading (Cowen), and continues for a week or longer. On the scalp, the eyebrows, the beard and the mustache, the scales are fine, furfuraceous, very abundant and quite adherent. In some instances, the palms and soles appear as if covered with a thick layer of collodion, and the exfoliation may bear a striking resemblance to the glove-like desquamation of scarlet fever. In

rare instances the nails may exfoliate, and more or less hair loss occ

Recurrences are frequent, both immediately following an attac and at intervals of several weeks or months. I have under observation a case in a young woman which has recurred at about the sa time every fall during the past four years. One of Crocker's patien had five attacks in seven years, and Tilbury Fox has recorded an i stance in which the recurrences were even more numerous.

Etiology.—The disease is very probably toxic in origin, and may be due to any one of several causes. Brocq is of the opinion that dry-skinned persons are more susceptible to it. Irritation of the alimentary canal, with reflex disturbances of the vasomotor centers is probably the basic factor in many instances. Gardiner considers insufficient kidney and bowel elimination prime factors in the causation.

Diagnosis.—The only disorder with which it is liable to be confounded is scarlet fever. From this disease it is to be distinguished by its short prodromal period, the absence of severe constitutional and throat symptoms, the early and abrupt commencement of desquamation, and the tendency to recurrence.

Treatment.—The patient should remain in bed, and the room be kept at a warm, uniform temperature. The elimination is important, and recourse should be had to saline cathartics and alkaline diuretics, if necessary. Inunctions of carbolized olive oil (0.5 to 1 per cent), or of zinc oil, are often needed to lubricate the skin and render the patient more comfortable. Calamine lotion, with the glycerine content increased to 8 per cent or even 10 per cent, is often helpful. It is exceedingly doubtful whether internal remedies of any kind hasten recovery. The diet should be semi-solid, with plentiful amounts of fruits, and mild acid drinks.

CLASS II.—INFLAMMATIONS.

ERYTHEMA MULTIFORME.

Synonyms.—Erythema exudativium multiforme; Erythema polymorphe.

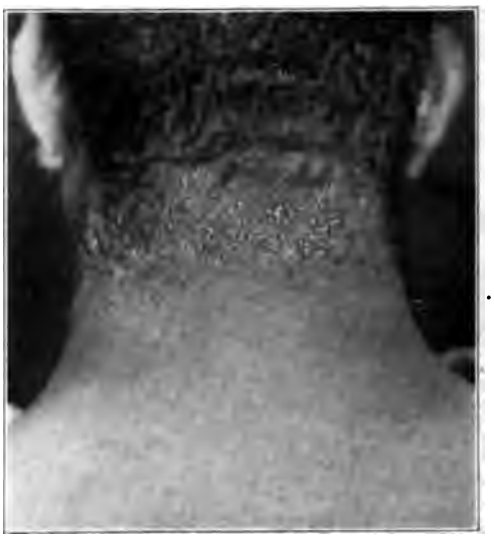
Definition.—Erythema multiforme is an acute, inflammatory disease of the skin, characterized by the development of reddish macules, papules, tubercules and vesicles of symmetrical distribution.

As its name implies, this disease is distinguished by the varied aspect of its lesions, which are seldom the same in any two cases,

Fig. 17.—Erythema multiforme, showing a characteristic distribution of the lesions. (Courtesy of Dr. May Blakesley.)

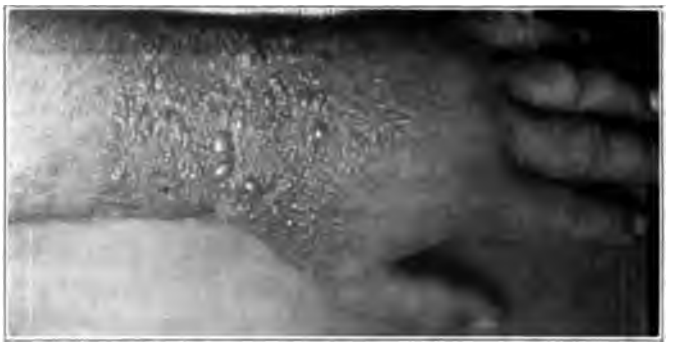
although certain individuals may repeatedly experience attacks in which the eruption practically duplicates itself in character and distribution each time. The lesions vary greatly in size and configuration, and the following clinical forms are recognized: Erythema papulatum; erythema tuberculatum or tuberosum; erythema vesiculosum; erythema bullosum; erythema circinatum; erythema iris; erythema gyratum; erythema marginatum.

Symptoms.—The papular is the most common type. The sites of predilection are the sides of the neck and face, the dorsal surfaces of the hands and forearms, the legs, and the dorsal surfaces of the feet. The lesions are bright or dark red in color, gradually fading to a purplish or violaceous hue, and seldom last longer than ten days or a fortnight. As a rule the subjective symptoms are slight. It is exceedingly probable, as Duhring suggests, that the disease is gener-



A.

B.



C.

Fig. 18.—*A*, *B*, *C*.— Erythema bullosum of unusual type. The disease involved the dorsal surface of the hands, and the posterior cervical region. Third attack.

ally of a milder type in the United States than in Europe. As encountered in this country, severe constitutional symptoms, such as fever, arthritis, etc., are rare, and an attack seldom lasts longer than two or three weeks. The lesions develop quickly, in from twelve to twenty-four hours, and the inflammatory process may be of sufficient intensity to convert papules and tubercules into vesicles and bullæ, with serous or even bloody contents. On the absorption of the effusion, iris-like lesions are formed, and these, continuing to enlarge, may coalesce with similar neighboring rings and produce gyrate curves and figures. In erythema marginatum the primary lesions

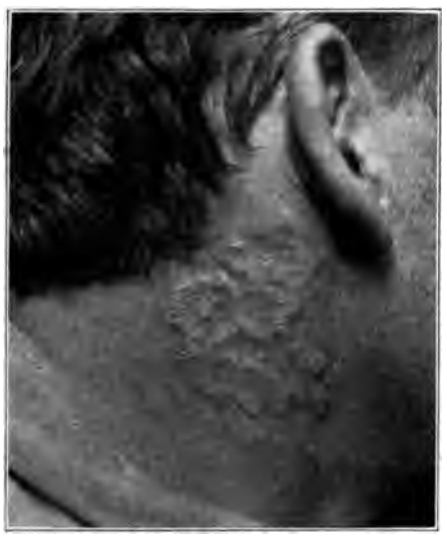


Fig. 19.—Erythema multiforme involving the cervical region. Both sides were affected.

are flat-topped, disc-shaped papules which gradually enlarge at the periphery, and regress in the center, forming large, circinate patches. The central portion may remain pigmented a faint chamois color for some weeks. In all types the color entirely disappears on pressure. Scarring is exceedingly infrequent and is probably the result of secondary staphylococcic infection. The extent of the eruption is variable. As a rule, the dorsal surfaces of the hands seldom escape. In rare instances the buccal mucous membrane may be involved. In the majority of cases the disease is self-limited, but in certain instances, as noted by C. Fox, Wende and others, the condition may persist indefinitely. This type of erythema multiforme, which is

called *erythema perstans,* has already been referred to under the erythemata, and was first described by Colcott Fox in 1901. Judging from the result of my observations on two cases, I believe these observers are correct in assigning the affection to the erythema multiforme group.

Etiology.--Erythema multiforme is a comparatively common dis-

Fig. 20.--Erythema multiforme in a negro. Lesions are of the iris type. (Courtesy of Dr. Lloyd W. Ketron.)

order, constituting about 1 per cent of all cases. A distinct etiologic factor is yet to be discovered, although numerous theories have been advanced to account for its causation. Micro-organisms have been isolated, principally from severe cases, by Legrain, Simon, Leloir, Finger, and others, but the findings have not been uniform, and it is probable that the cutaneous symptoms in the cases investigated were but superficial manifestations of certain systematic disturbances which varied greatly in nature and origin. In a case reported by Corlett,

the disease followed streptococcic infection of a gunshot wound. As Osler has pointed out, the disorder may involve the viscera, the serous or mucous membranes, the brain, or the integument, singly or collectively. Török, Vas and Hari (cited by Fordyce), and Philippson believe that both the erythema and urticaria are of hematogenous origin, and that they are a result of emboli of toxic products,

Fig. 21.—Erythema multiforme of the bullous type in a young girl.

bacterial, medicinal and metabolic. Fordyce and McBride and Schorer are inclined to the belief that anaphylaxis plays an important part in the etiology, and Jaquerol has recently called attention to the clinical relationship existing between the erythema multiforme group and urticarial eruptions due to food sensitization. The fact that lesions indistinguishable from those of erythema multiforme may develop following the ingestion of certain drugs is readily explainable on the deduction that these chemical agents when introduced into the system lead to the formation of albuminoid bodies which act as alien proteid.

Stelwagon, Pusey, and others hold that the disorder is probably the result of a toxemia of intestinal or similar origin. The ingestion of certain varieties of stale food, especially fish and canned meats, is undoubtedly causative in some instances. The disease occurs oftenest in the fall and spring, but Duhring believes that rain and dampness have more to do with its production than the time of year. Judging from the evidence now at our disposal, I believe the anaphylactic explanation to be the most plausible one that has yet been advanced.

Pathology.—The histology of the lesion has been exhaustively

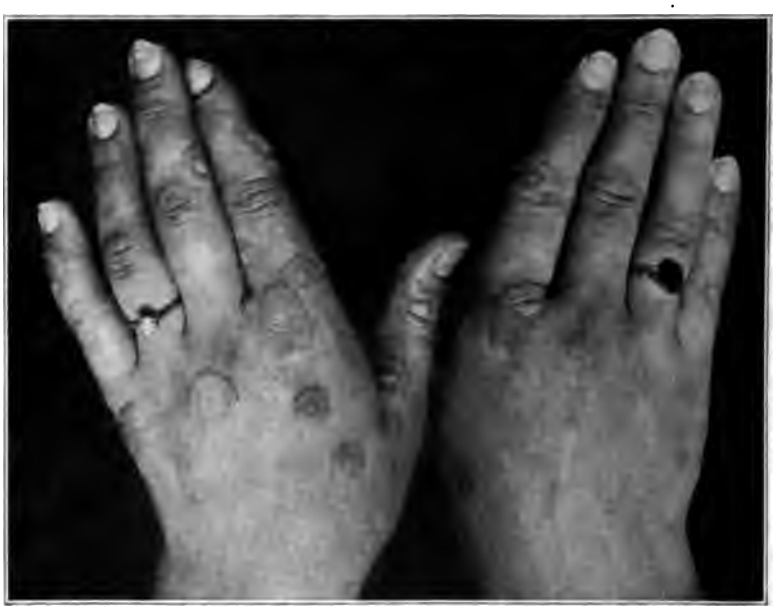


Fig. 22.—Erythema multiforme. Iris type. Characteristic distribution. (Courtesy of Dr. H. C. Varney.)

studied by Leloir, Unna, Gilchrist, Pardee, and others. The changes in the cutis are those of an acute, localized inflammation. The process is confined almost entirely to the papillary layer, and is characterized by vascular dilatation, perivascular cellular infiltration and proliferation, more or less emigration of leucocytes and even of red cells, and edema of the cutis. The collagenous tissue is swollen and transparent, and stains poorly. The elastic fibers are hardly recognizable. In herpes iris, Pardee found that the vesicle was formed by the lifting up of the entire epidermis from the papillary body. The contents of the vesicles consisted of coagulated serum, lympho-

cytes, polynuclear leucocytes, nuclear detritus, and strands of fibrin. No infarcts were noted, and the coil ducts, hair follicles and sebaceous glands were unaffected.

Diagnosis.—The diagnosis of erythema multiforme is as a rule not

Fig. 23.—Erythema bullosum.

Fig. 24.—Erythema iris. (Courtesy of Dr. Howard Fox.)

difficult. The multiformity, and the bright or dark red color of the eruption, its symmetrical distribution, and predilection for the dorsal surfaces of the hands and feet, and the cheeks and sides of the neck, the tendency to assume ring shapes, the absence of itching, and the course

of the disease, all are characteristic. It may be confused with urticaria, which it occasionally slightly resembles, but the color and distribution of the lesions and their non-pruritic character, together with the fact that they are never transitory as in urticaria, should prevent error. From pemphigus the bullous and vesicular types are to be distinguished by their multiform character, color and distribution. Cases presenting buccal involvement might be confused with foot-and-mouth disease.

Prognosis.—As encountered in the United States, the average case of erythema multiforme gets well in from two to four or five weeks, even without treatment. One or two recurrences a year are not infrequent, however, and in some instances the recurrences may be so frequent as to give the disorder almost a chronic aspect. In the more serious types, which are much more common in Europe than in this country, the prognosis is dependent upon the degree of constitutional involvement.

Treatment.—The treatment is essentially symptomatic. The bowels and kidneys should be flushed daily, with salines or alkaline diuretics if necessary, and the patient should drink plentiful amounts of water. The diet should be freed of greasy, indigestible foods, shell and preserved fish, tomatoes and coffee. Alcohol is interdicted. Various internal remedies, such as quinine, salicin, potassium iodide, and ergot have been recommended, but I have never seen any benefit directly traceable to their use, and some of them, by their effect on the digestive tract, may be even harmful. MacGowan reports good results following the administration of adrenalin chloride solution (ten drops every two or three hours), and McBride has also found this remedy a valuable one. C. J. White has found calcium lactate helpful. In individuals of lowered vitality, the elixir of iron, quinine and strychnia, or full doses of the compound syrup of hypophosphites is of value. In the persistently relapsing cases the diet should be carefully regulated in order to exclude, if possible, any etiologic factor from this source. Locally, desiccating powders, dry or suspended in lotions (as calamine lotion), are indicated. In the bullous cases, recourse may be had to antiseptic dusting powders, like thymol iodide. The bullae may be drained, by puncturing them with a sharp bistoury, and the powder applied and covered with a cotton or gauze pad.

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ERYTHEMA NODOSUM.

Definition.—Erythema nodosum is an inflammatory disease of the skin which is accompanied by a variable degree of constitutional disturbance and is characterized by an eruption consisting of a few or several, rounded or oval, painful nodules which persist for two or three weeks and then disappear spontaneously.

Symptoms.—The symptomatology of erythema nodosum was accurately described by Erasmus Wilson, more than fifty years ago. The appearance of the cutaneous lesions is usually preceded by a slight rise of temperature, general malaise, and rheumatoid pains. The nodules develop quite rapidly and reach their full size in from six to twenty-four hours. They are circular or oval in outline, tense, shiny, and bright red in color, and commonly involve the extensor surfaces of the arms and legs (particularly the anterior tibial regions), their long axes parallel with those of the affected limbs. In length, they vary from 1. to 5. cm., and are often distinctly raised above the surface of the surrounding skin. They may be firm or elastic, or soft in consistency, and are deeply imbedded in the skin. Their outline is fairly well, but not sharply, defined, and they are very tender and painful on pressure. After attaining their full size, they gradually subside, changing in color from bright red to red, then dark red and purplish, and finally disappear, leaving greenish or brownish stains, which persist for several days. During the period of regression the lesions often become soft and fluctuant, and may be mistaken for abscesses. Suppuration of the nodes does occasionally occur, but it is an exceedingly rare and probably accidental complication. As a rule the mucous surfaces are not affected. Visceral involvement also is rare. In number the lesions vary from two or four to a score or more. They are generally symmetrical, and in those instances where the involvement is extensive, nodules sometimes appear in crops and the attack may be prolonged over several days or weeks.

Etiology.—The results of Rosenow's investigations show that at least a certain percentage of cases of erythema nodosum are due to a micro-

organism, a streptococcus. It occurs most frequently between the first and third decades, and during the spring and fall. In rare instances, attacks have followed the ingestion of certain drugs, such as the iodides and antipyrine. Mackenzie found it complicating rheumatism, and even endocarditis of non-rheumatic origin. It may follow the infectious exanthemata. Some French writers consider it tuberculous. In Bronson's case, there was an associated tuberculosis. It is probable that there are two or even more types of the disease. One, closely allied to erythema

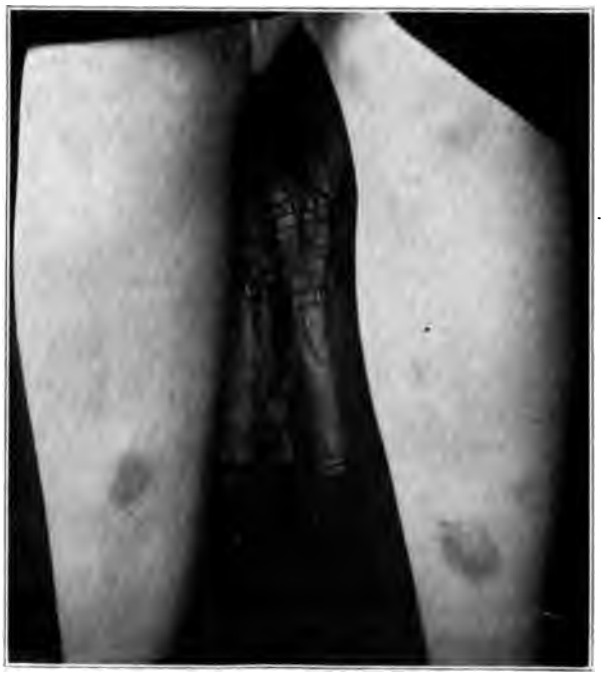

Fig. 25.—Erythema nodosum.

multiforme, may result from the ingestion of certain substances which are either toxic in themselves or set up changes in the intestinal tract which result in the formation of toxins. The second, and usual type, is probably microbic in origin, and due to the same bacteria that are causative in certain forms of rheumatism (Rosenow), while a possible third type, which sometimes bears a striking clinical resemblance to the second variety, is really tuberculous in origin, and should be designated "erythema induratum disseminatum."

Pathology.—The epidermis is little altered. The vessels of the

papillary plexus are dilated, with extravasation of both white and red cells. In some of the capillaries the leucocytes are packed so closely that the collections resemble white thrombi. There is widespread infiltration throughout the corium. Late in the disease, the disintegration of the extravasated red cells gives rise to more or less pigmentation.

Diagnosis.—The multiplicity of the lesions, their symmetry, and the attendant constitutional symptoms, should serve to differentiate them from gummata, bruises and abscesses. From the abscesses of sporotrichosis they are to be recognized by their symmetrical distribution and the absence of a primary point of infection. In erythema induratum the sites of predilection are the calves of the legs. the disease is insidious and of slow development, the lesions are dark red from the beginning, and sometimes ulcerate, and the majority of the affected individuals present other signs of tuberculosis.

Prognosis.—In the majority of instances the prognosis is favorable, complete recovery taking place within the course of one month. In a series of eighty cases observed by Harrison, there was not a single recurrence. During the course of an attack the heart should be examined at intervals of a few days by a competent man, in order to detect pericardial or endocardial involvement, should it occur.

Treatment.—The patient should abstain from exercise, and confinement to bed is advisable (if practicable). The bowels and kidneys should receive attention. Of the internal remedies that have been advised, quinine, salicin and sodium salicylate are the most popular. The latter is particularly to be advised if there are any associated rheumatic symptoms. Locally, a 10 per cent ichthyol ointment may do good, or, if there is present a feeling of tenseness, a mild, soothing astringent, as lead and opium lotion, may be applied.

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URTICARIA.

Synonyms.—Nettlerash; Hive.

Definition.—Urticaria is an acute inflammatory affection characterized by the development of whitish, pinkish or reddish wheals which are usually evanescent and are accompanied by itching and stinging sensations.

Symptoms.—The lesions in urticaria vary greatly in size and considerably in shape. They usually appear suddenly, often without accompanying or preceding symptoms of gastrointestinal involvement. Their formation may be preceded by burning and tingling sensations, but usually these precursory manifestations are absent or of exceedingly brief duration. The elevations are pinhead- to finger nail-sized at first, but frequently coalesce to form oval, rounded or irregular patches. Occasionally they are linear or concentric. The individual wheals are whitish or pinkish in color, often with a hyperemic areola, and give rise to intense stinging, burning and itching.

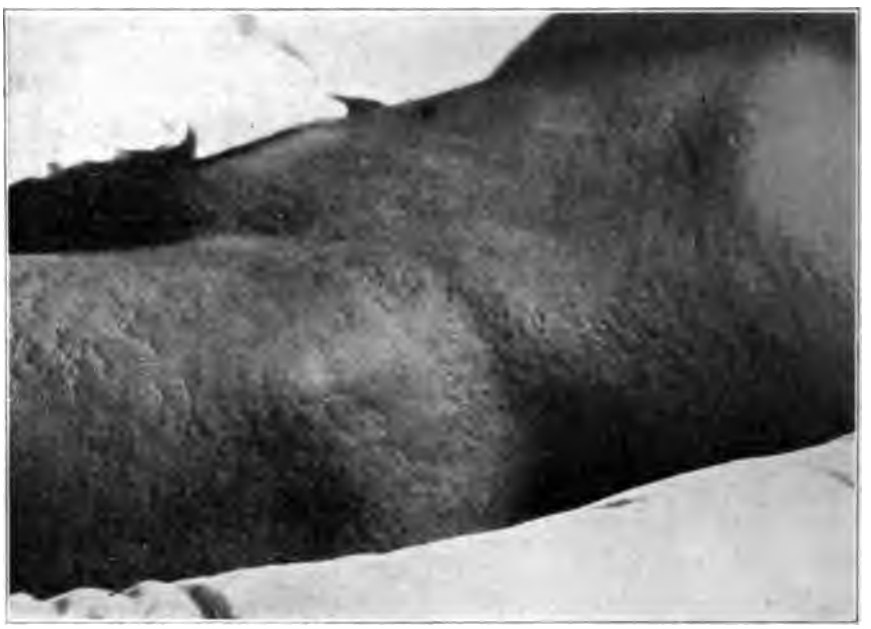

Fig. 26.—Urticaria. (Courtesy of Dr. Otto Leslie Castle)

They may be soft or firm to the touch, and their bases are seldom sharply defined. In severe cases bullae may develop, or the wheals may become hemorrhagic and be followed by more or less temporary pigmentation. Any or all parts of the body may be affected, but the sites of predilection are the lower trunk, the buttocks, and the outer surfaces of the thighs. In ordinary cases the lesions persist for several minutes or an hour or more, and then disappear spontaneously, leaving no trace. In exceptional instances (urticaria perstans) their duration may be much longer. The uninvolved skin is apparently

normal, but no part is immune from attack. Scratching and rubbing usually render the lesions worse instead of better, and usually provoke a new outbreak in regions previously unaffected. The mucous mem-

Fig. 27.—Dermographism in an urticarial subject. (Courtesy of Drs. Young and Brock.)

Fig. 28.—Urticaria acuta. (Courtesy of Dr. Arthur E. Hertzler.)

branes, particularly those of the larynx, may also be involved. In susceptible individuals there occasionally exists a condition of irrita-

bility of the cutaneous vascular apparatus which is characterized by the occurrence of lineal wheals or welts which may be provoked by simply rubbing or stroking the skin with some pointed instrument. This is known as "dermographism" or "autographism."

Urticaria may be acute or chronic. The *acute variety* is by far the most common, an attack extending over a period of three or four days. During this time crops of new lesions are constantly appear-

Fig. 29.—Urticaria papulosa.

ing, and the older ones gradually subsiding. Recurrences are not infrequent, particularly in "sensitized" individuals. In urticaria papulosa, or lichen urticatus, the lesions are papular and yet possess some of the characteristics of wheals. They are pinhead- to pea-sized, flat or acuminate, sharply defined, and intensely itchy, and are usually comparatively few in number. Occasionally they are ac-

companied by ordinary wheals. This type is observed most frequently in poorly nourished children (although adults are not immune), and the loins and buttocks are the sites of predilection. It is an obstinate and stubborn type of the disease, and is worse in summer than in winter. Clinically, it closely resembles the prurigo of Hebra.

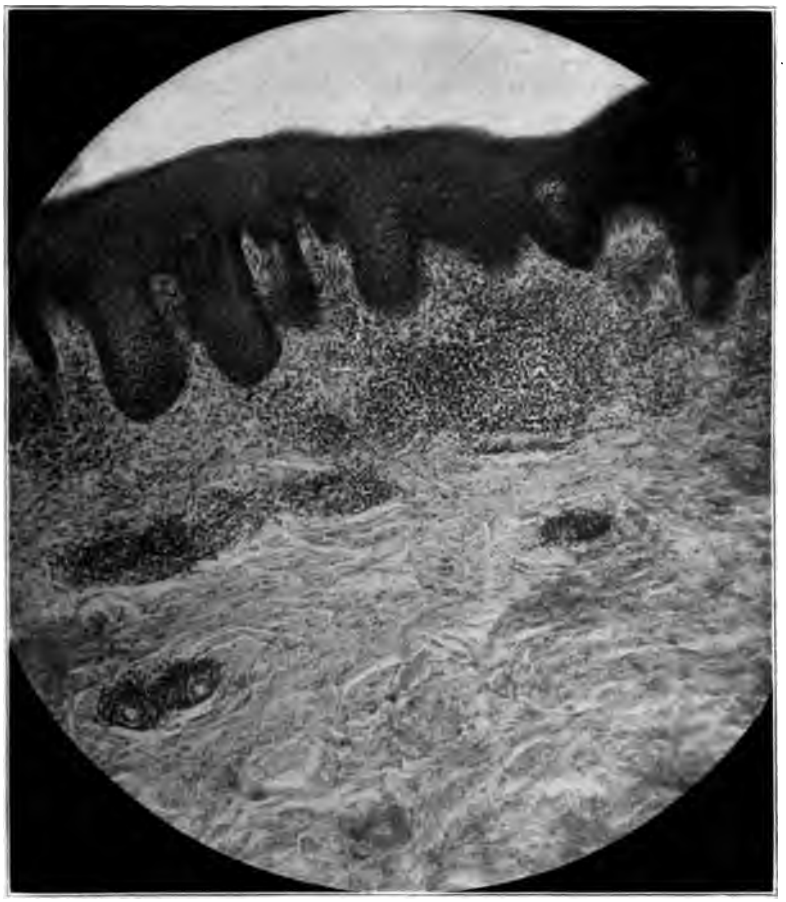

Fig. 30.—Urticaria acuta. Moderate magnification. Note vascular changes, and cellular exudate.

Chronic urticaria is of two distinct varieties. In the first, and most frequent variety, the affection consists simply of many and closely repeated attacks of urticaria of the acute type. These attacks may extend over a period of months or even years. Erasmus Wilson has recorded an instance in which the disorder persisted for two years, and

was terminated only by the death of the individual (from an intercurrent disease).

The second, the *Urticaria Perstans of Pick,* and more clearly defined variety, is characterized by the occurrence of small, persistent, wheal-like tumors which develop from or accompany the ordinary lesions of urticaria. When the transient disorder is factitiously produced by scratching, the persistent lesions also respond by becoming hyperemic and more prominent.

An attack of urticaria occasionally follows the ingestion of certain articles of food, particularly shell fish, over-ripe game, pork, nuts, mushrooms and cucumbers, and it may result from the administration of various drugs.

Etiology.—It is very probable that urticaria is always due to anaphylaxis. The precipitation of attacks by the ingestion of these various proteids and especially by the introduction into the system of foreign proteids in the form of sera, bacterial products (from focal infections), etc., greatly strengthens this belief. Drugs or similar medicinal agents probably do not act directly, but their presence doubtless gives rise to conditions favorable to the development of substances which are capable of stirring up trouble in sensitized individuals. The same may be said of divers emotional and psychic states, such as fright, anger, and sudden grief or mental shock. The hereditary predisposition occasionally seen also tends to strengthen this supposition, Rosenau, Anderson and others having shown that a susceptibility to horse serum may be transmitted by a female guinea-pig to her offspring. Wright, Paramore and others hold that a lack of lime salts in the blood, with resultant tardiness in coagulability, is an important, if not essential factor, in the causation of urticaria.

Pathology.—Gilchrist has shown that a true wheal is an acute, inflammatory, edematous swelling, due to the action of a toxic agent which may reach the skin from within or from without. The principal changes occur in the papillary and subpapillary regions, and consist in vascular dilatation, with profuse outpouring of serum and white cells. The dilated vessels are filled with leucocytes. Throughout the affected area perivascular infiltration is a prominent feature. As in erythema multiforme, the cellular exudate is denser in the vicinity of the coil gland ducts. The lymph spaces also are dilated, and filled with granular material and débris, not unlike that found in cases of poisoning from diphtheria toxin.

Diagnosis.—The history, the distribution, and the evanescent char-

acter of the lesions should serve to differentiate the disorder from erythema multiforme, scabies and pediculosis. It should be borne in mind that the disorder may occasionally coexist with one or the other of the last two.

Prognosis.—As ordinarily encountered, an attack of urticaria is self-limited, and the lesions all disappear spontaneously in the course of a few hours or days. Urticaria of the chronic recurrent type, as

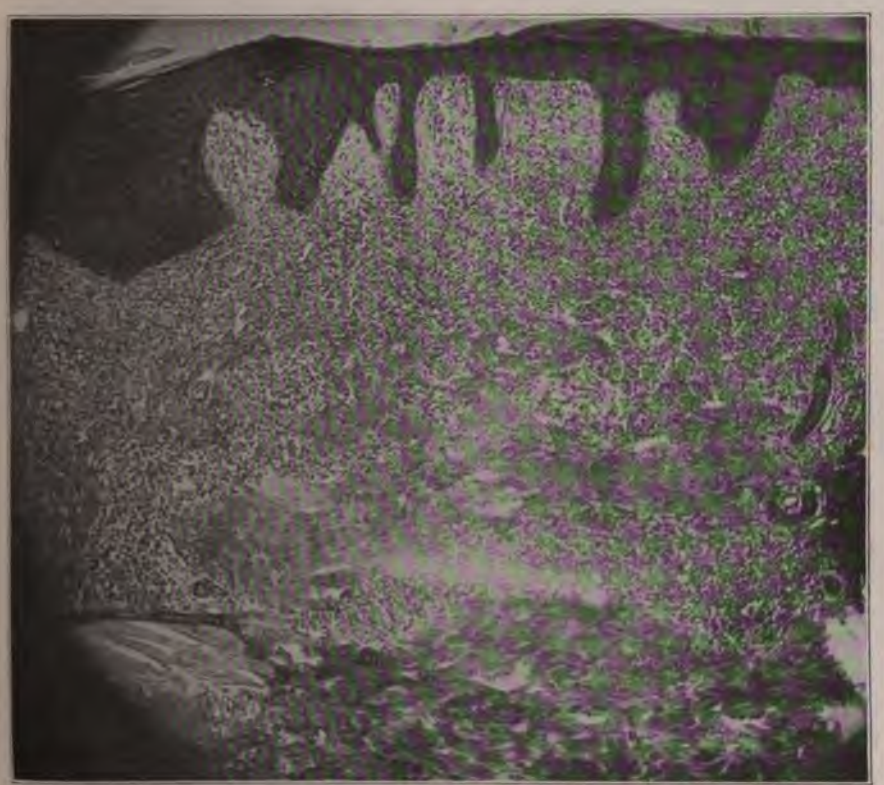

Fig. 31.—A section from a persistent lesion of urticaria perstans. Low magnification.

well as urticaria perstans, may persist for months if the exciting cause is not removed.

Treatment.—In the acute cases the main object is to locate and get rid of the exciting cause, and this is not always an easy matter. While strange or unusual foods may be the provocative factor, not infrequently some very simple article of diet, as eggs or berries, may be the principal offender, and it is only after suffering from repeated attacks that

the patient is able to recognize this cutaneous food reaction. In the majority of instances it will be found that the offending material was ingested a short time prior to the onset of the attack. If the substance has not yet passed from the stomach, an emetic is indicated. In the majority of instances, however, a cathartic also is necessary, and one of the salines best serves the purpose. In the chronic recurrent type, the disorder sometimes taxes the resources of the medical attendant to the utmost. Careful search should be made for the causative factor. The possible presence of focal infection is always to be borne in mind. In two different cases under my care, both having persisted for months despite treatment, relief was prompt and permanent following the extraction of diseased (granulomatous) teeth. In three other chronic cases, occurring in a mother and her two children, egg albumin proved to be the substance at fault. Generally speaking, the bowels and kidneys should be kept active, and the patient should drink plentiful amounts of fresh water. Coffee and tea accomplish no good, and may do harm. Pickles, cucumbers and similar articles of food should also be excluded, on general principles. Of the internal remedies recommended, I have found a cascara and bile salt preparation quite valuable. An occasional mercurial purge (and nothing acts so well in my hands as two or three compound cathartic pills, U. S. P., at bed hour, followed by a saline before breakfast on the following morning), is helpful. The calcium preparations, as recommended by Wright, have been given a thorough trial by C. J. White and others. In the twenty-three cases in which the remedy was tried, White noted great improvement in twelve, slight improvement in two, and none whatever in nine. MacGowan recommends adrenalin solution, in ten minim doses every three or four hours, and Pusey has noted satisfactory results following the administration of pilocarpin. Acting on the suggestion of my friend, Dr. W. W. Duke, I have employed emetine hydrochloride, gr. 1-2 (0.03 gm.), administered hypodermically, once daily, for a period of a week or ten days, with excellent results in two exceedingly persistent cases of the disorder. The injection of a foreign proteid, as typhoid bacterin, sometimes proves beneficial. This method, first suggested to me by Duke, in 1916, and more recently recommended by Engman and McGarvy, is a simple and harmless one, and should be given a trial in obstinate cases of the disorder. Five hundred million of the dead organisms may be injected, subcutaneously or intravenously, twice weekly, for a month or more. Of the local applications that may alleviate the itching, carbolized calamine lotion, with or without small amounts (5 or 10 per cent) of liquor carbonis detergens added, saturated aqueous solu-

tion of sodium carbonate or bicarbonate, borax, sodium chloride, ammonium chloride, or magnesium sulphate baths (one ounce of the drug to the tub of water), and vinegar applications may be tried. As a rule, salves are not very satisfactory agents in this disorder, but zinc oil, with 1 percent. each of carbolic acid and menthol added, sometimes proves comforting, and cycloform ointment (25 per cent) also occasionally gives relief. Anderson's antipruritic powder:

℞	Amyli pulveris	3 vi	(24.0)
	Zinci oxidi	3 iss	(6.0)
	Camphoræ pulveris	3 ss	(2.0)

Misce et fiat pulvis.

dusted on freely several times daily is both cleanly and comforting.

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URTICARIA PIGMENTOSA.

Synonyms.—Xanthelasmoidea (C. Fox); Urticaria perstans pigmentosa (Pick); Xanthomoidea (Duhring).

Definition.—Urticaria pigmentosa is a chronic inflammatory disease of the skin characterized by the occurrence of lesions which resemble ordinary wheals in many respects, but the majority of which persist, and ultimately become pigmented.

Symptoms.—The disorder is comparatively rare in America, and probably occurs most frequently in Great Britain. The first case was recorded in the latter country by Nettleslip, in 1869. Since then about one hundred and fifty cases have been reported from various parts of the world. The disease generally begins in early infancy, with the appearance of wheals, papules and nodules which may not at first be differentiated from those occurring in urticaria of the ordinary type. The trunk seldom escapes involvement, but no region is exempt. Some of the lesions disappear spontaneously in the course of a few hours or days, but the majority persist, and in the course of a week or so become more or less pigmented. When in close prox-

inity, the wheals sometimes tend to coalesce, but seldom form large patches like those so frequently seen in urticaria acuta. The individual wheals and nodules are slightly elevated, with firm and well-defined bases and of a chamois or brownish color. Vesiculation occasionally occurs, as in the cases exhibited by Pusey and by Biddle. New lesions develop from time to time, and the older ones gradually subside, sometimes leaving atrophic spots, or even cicatrices (Hallopeau, Crocker). Itching may be slight or entirely lacking, but it is usually quite severe from the very first. The itching and pigmentation may persist long after the disappearance of the lesions. The duration of the disease is indefinite. In the majority of instances comparatively quiescent periods are noted, which sometimes extend over periods of weeks or even months.

Fig. 32.—Urticaria pigmentosa. (Courtesy of Dr. L. W. Ketron.)

There is a type of pigmentary urticaria in which the lesions clinically resemble those of the usual form, but when examined histologically are found to be entirely free of the characteristic mast cells. Ormsby exhibited such a case at the annual meeting of the Chicago Dermatological Society, in 1917, and I saw a second case, through the courtesy of my friend, Dr. Holt, of Gueda Springs, Kansas, in the fall of 1916. Both patients were young women, and the lesions had developed quickly, and after puberty.

Etiology.—Little is known regarding the etiology. The majority of the cases occur in infants, although in Elliot's patient the disease did not begin until the twenty-seventh year, and two of Little's cases began at the twenty-second and thirty-second year, respectively. Duhring holds that there are two distinct types of the disease,

Fig. 33.—Urticaria pigmentosum. Several of the lesions became vesicular. (Courtesy of Drs. A. P. Biddle and R. A. C. Wollenberg.)

Fig. 34.—Urticaria pigmentosa. (Courtesy of Dr. J. B. Shelmire.)

Fig. 35.—Urticaria pigmentosa in an adult. (Courtesy of Dr. William Allen Pusey.)

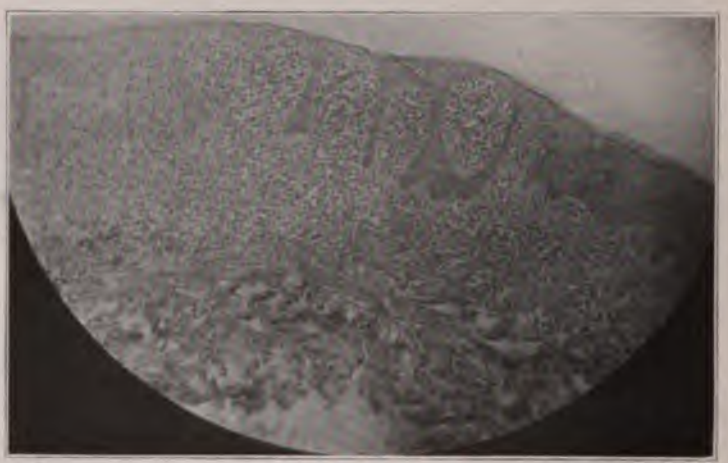

Fig. 36.—Urticaria pigmentosa, showing character and location of cellular infiltrate. (Author's photograph of Dr. William Allen Pusey's specimen.)

one being a persistent urticaria of a peculiar type, the other presenting many of the features of a multiple, benign new-growth, something like xanthoma tuberosum. Stelwagon believes the disorder to be essentially an urticaria, the subsequent peculiarities being a result of secondary changes.

Pathology.—Histologically the lesions resemble those of ordinary urticaria, but instead of the usual collection of leucocytes there is an enormous infiltration of mast cells. The source of the latter is problematic. Unna is of the opinion that they develop locally from connective tissue cells which take up mast cell granules. Fresh de-

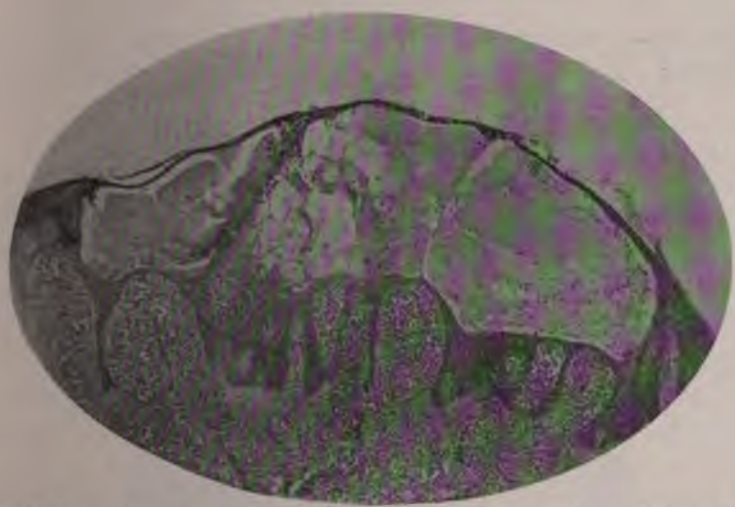

Fig. 37.—Urticaria pigmentosa, showing vesicle formation. An extremely rare lesion. (Courtesy of Dr. William Allen Pusey.)

positions of these peculiar bodies occur with each exacerbation of the disease.

Diagnosis.—Urticaria pigmentosa is to be differentiated from urticaria and from xanthoma tuberosum. The early appearance of the lesions, their persistence, and the presence of pigmentation, serve to distinguish it from the former, while the evanescent character of some of the lesions, the intense itching, and the usual youth of the patient prevent its being mistaken for xanthoma.

Prognosis.—The disease usually tends to disappear as puberty is reached. Little benefit can be derived from the use of medicinal agents.

Treatment.—Of the many remedies suggested, pilocarpine and

atropine are probably the most useful. For the relief of the itching the various antipruritics suggested in the treatment of urticaria may be tried.

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EDEMA ANGIONEUROTICUM.

Synonyms.—Bannister's disease; Quincke's disease.

Definition.—Angioneurotic edema is an acute inflammatory dis-

Fig. 38.—Edema angioneuroticum.

ease of the skin characterized by the presence of single or multiple, circumscribed, evanescent, edematous swellings.

Symptoms.—Clinically and histologically the lesions do not essentially differ from those of urticaria, the variation being one of size only. The first recorded observation of this disorder, although usually credited to Quincke, was made by Bannister, of Chicago. The

regions most commonly involved are the lips, the eyelids, and the lobes of the ears, although the extremities, trunk, larynx, and genitalia occasionally are involved. The lesions are somewhat more persistent than those seen in urticaria, and an attack may be extended over a period of several days by the occasional development of new lesions. In susceptible individuals recurrences are not infrequent. The subjective symptoms vary. As a rule there is a feeling of stiffness and tension in the part, with some itching and burning. The remarks on the diagnosis, prognosis and treatment of acute urticaria apply equally to this affection.

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DERMATITIS EXFOLIATIVA.

Synonyms.—Pityriasis rubra; General exfoliative dermatitis; Dermatitis exfoliante (Besnier); Dermatitis exfoliatrice (Brocq).

Definition.—Dermatitis exfoliativa is an acute or subacute inflammatory disease of the skin which commonly involves the whole surface and is characterized by redness and abundant flaky desquamation.

Symptoms.—Dermatitis exfoliativa may be either primary or secondary. In the primary variety an attack may be preceded and even accompanied by slight fever, debility, and gastrointestinal disturbances. The eruption appears suddenly, and may be either patchy or universal. Pinkish or reddish at first, and symmetrically distributed, it soon changes in color to dark red, and in the course of a few days the affected areas become covered with thin, flaky, loosely adherent, grayish or brownish scales. On the face and other exposed parts these are generally small, but on the body they may reach a diameter of several centimeters. On the flexor surfaces of the hands and feet the outer corneous layers are sometimes thrown off in glove-like casts, as in scarlatina and erythema scarlatinoides. The nails and hair are usually involved, and both may be shed. In the majority of instances there is little or no itching, although the skin is exceedingly tender, and the patients often complain of feelings of tension and stiffness. The amount of scaling varies, but is always profuse, and a liter or more may be exfoliated during the course of twenty-four hours. The acute cases exhibit very little cutaneous

thickening, but in the long standing and recurrent types the infiltration may be very considerable. As a rule, there is no vesiculation or exudation. An outbreak generally lasts for several weeks or months, but relapses are frequent and recurrences not uncommon. Only one or two regions may be involved at first, but commonly the eruption is more or less universal before the termination of the disease.

In the secondary variety the condition follows certain chronic, scaly affections of the skin, such as eczema, psoriasis, and seborrheic dermatitis. In many instances it is probably the result of too vigorous use of stimulating local applications (like chrysarobin, mercurial ointment and arnica). Ultimately these cases may revert to the parent disorder. As a rule, they are more persistent than those of the primary variety. Pigmentation is not infrequent, and the skin may assume a slate or mahogany color.

Etiology.—The essential cause of dermatitis exfoliativa is unknown. It is most frequent in middle life, and in males (three to one). Crocker believes that acute rheumatism is a prominent factor in the etiology of the primary variety, and Jadassohn has pointed out the frequency with which the disease is associated with tuberculosis. Aside from the influence exerted by pre-existing dermatoses, such as psoriasis, eczema, seborrheic dermatitis and dermatitis resulting from the employment of local irritants (as chrysarobin), internal medicinal agents, particularly quinine, sometimes play an apparently prominent part in the causation.

Pathology.—The histological changes vary with the intensity and duration of the affection. In an early case Crocker found that the disease process extended only to the subpapillary layer. The papillary bodies were somewhat enlarged, and considerably elongated, and both they and the subjacent corium were moderately infiltrated with leucocytes. The cellular exudate was greatest in the vicinity of the vessels, and around the coil gland ducts. The rete was thinned, particularly in the superpapillary regions, and the lower third of the horny layer was tightly adherent. The upper two-thirds of the stratum corneum was split off, but remained in a solid sheet, unlike the scale of psoriasis. The individual rete cells were unaltered, and although the lumen of the coil gland ducts in this region was occluded there was no cellular infiltration.

In cases of long standing there is more or less atrophy of both the papillæ and the sebaceous glands, and frequently the rete contains

much pigment. The corneous layer is thickened and lamellated. The papillary vessels may be thrombosed, and the corial tissue show degenerative changes (Petrini and Babes.)

Diagnosis.—The disease is to be distinguished from erythema scarlatinoides, scarlatina, psoriasis, eczema, pemphigus foliaceus and lichen ruber. In its earlier stages it closely simulates erythema scarlatinoides. In the latter disorder the onset is more acute, the scales are larger, fewer in amount, and more adherent and lack the flaky, imbricated character which is more or less characteristic of those seen in dermatitis exfoliativa.

Psoriasis is probably never universal, and generally spreads quite slowly. The scales are silvery white, adherent, and leave a minute bleeding point when forcibly removed. Eczema is characterized by its multiform character, the frequent presence of exudation, the intense itching, the scanty scaling, and the infiltration which is almost invariably present. Neither psoriasis nor eczema is accompanied by appreciable constitutional symptoms. In pemphigus foliaceus the odor, the semipurulent discharge, the raw oozing surfaces, and the flaccid bullae should prevent confusion.

Prognosis.—The prognosis in dermatitis exfoliativa should always be guarded. It is never possible to predict freedom from recurrences, and a small percentage of the cases develop toxic symptoms, often without appreciable cause, and death may ensue.

Treatment.—The condition of the patient's general health should receive attention. For internal use, sodium salicylate, quinine (Crocker), and arsenic, as well as cod liver oil, iron, and similar tonics, have been recommended. Locally, soothing oily applications (such as carbolized zinc oil) are comforting and hasten healing. Carbolized carron oil also is excellent. Foster recommends prolonged, or continuous, warm baths. C. J. White found liberal applications of powder (the patient is kept between sheets, and continuously enveloped in corn starch, talcum or similar bland powder), as originally recommended by Engman, helpful and possibly curative.

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DERMATITIS EXFOLIATIVA EPIDEMICA.

Synonyms.—Epidermic exfoliative dermatitis; Savill's disease; Epidemic eczema.

In December, 1891, Savill described a peculiar eczematoid affection which had occurred as an epidemic in several London infirmaries and work houses during the autumn months. Smaller outbreaks have occurred since in the same city, and sporadic cases have been reported by Fordyce, Winfield and others in this country. As observed by Savill, there were two clinical varieties of the disorder; the first was moist and resembled eczema, the second was dry and closely simulated pityriasis rubra. The majority of the patients were middle-aged or elderly. There was generally associated involvement of the cervical lymphnodes. The constitutional symptoms were remarkably slight, and there was seldom any precursory or accompanying fever. The arms, face and scalp were usually attacked first. The disease began as purplish or reddish macules or papules which tended to coalesce, forming red patches, and these, in turn, spread peripherally until the entire body was involved. As a rule, the eruption was symmetrical from the first. Exfoliation commenced early and persisted for four or five weeks. The hair and nails were shed in several cases. Some of the early lesions became vesicular at the end of the second or third day, with the development later of moist, eczematoid patches. The origin of a few lesions could be traced to local causes, and in these instances the prompt application of tincture of iodine generally aborted the attack. In the majority of instances the disease ran its course in six or eight weeks, but recurrences were not infrequent. In some of the more debilitated patients death resulted, usually from exhaustion. The disease was investigated bacteriologically by Savill and by Russell. Both isolated a diplococcus in "rod-like segments" which in some respects resembled the staphylococcus aureus, but which did not liquefy gelatine.

The histology of the lesions was investigated by Savill and by Echeverria. The former found engorgement of the corial vessels, with serous effusion, and extravasation of leucocytes. Echeverria found what he thought to be a remarkable form of degeneration of the prickle-cell nuclei. The disorder appeared to be very little influenced by treatment. It is probable that the therapeutic measures commonly employed in combating infectious eczematoid dermatitis would be beneficial here; large doses of a reliable autogenous vac-

cine, and liberal local applications of 1 to 2 per cent ammoniated mercury ointment.

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DERMATITIS EXFOLIATIVA NEONATORUM.

Synonyms.—Ritter's disease; Keratolysis neonatorum; Dermatitis exfoliativa infantum.

In 1878, Gottfried Ritter von Rittershain, of Prague, first described a desquamative dermatitis of the newborn which in many respects simulates the dermatitis exfoliativa of adults. The disorder

Fig. 39.—Dermatitis exfoliativa neonatorum. (Courtesy of Dr. Frederick G. Harris.)

is comparatively rare in this country, although cases have been described by Elliott, Foster, Hazen and Stelwagon. The disease begins as a localized hyperemia of the skin, commonly in the region of the chin. The redness gradually spreads, until the major portion, or all, of the body is involved. The mucous membranes may be attacked. At some time in the course of the attack there is profuse desquamation of the outer corneous layer. The desquamative process may be so severe in character as to expose the underlying prickle layer, with the resulting development of an eczematoid condition. Secondary staphylococcic infection is not infrequent, and furunculosis may develop. In a few instances the eruption instead of being erythematous in character has been distinctly vesicular or bullous. Constitutional symptoms are slight, or altogether wanting. The disorder is self-

limited, and recovery or death generally ensues in from a fortnight to a month. In debilitated and marasmic infants death is not infrequent.

Etiology.—The cause of the disease is not known. It is extremely probable that the disorder is sometimes confused with pemphigus, particularly pemphigus foliaceus, physiologic desquamation of the newborn, and even epidermidolysis bullosa. Von Rittershain considered it a pyemia, and both Winternitz and Hazen isolated the staphylococcus pyogenes albus from the blood and from fresh vesicles. The pathologic anatomy shows nothing distinctive.

Prognosis.—Almost 50 per cent of von Rittershain's cases proved fatal. The majority were in institutional babies, however, often of lowered vitality.

Treatment.—The internal treatment is tonic and supportive. Locally, soothing, oily applications, to which a small percentage of ammoniated mercury or ichthyol (0.5 to 1 per cent) has been added, are indicated. It is absolutely essential that the child be protected from cold and from sudden temperature changes. Autogenous vaccines might be of service.

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KERATOLYSIS.

Keratolysis, or deciduous skin, is a condition clinically somewhat analogous to relapsing scarlatiniform erythema, in which an individual possesses a skin which, like that of certain reptiles, is cast off at more or less definite intervals. Such cases have been reported by Preston, Frank and Sanford, Klotz, Stelwagon and others. The shedding usually occurs piecemeal, in large sheets, and is preceded by slight constitutional disturbances. Sangster regarded his case as one of congenital malformation of the skin.

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PELLAGRA.

Synonym.—Lombardian leprosy.

Definition.—Pellagra is a systemic disorder, characterized by

symptoms of gastrointestinal and cerebrospinal disturbance, with associated cutaneous manifestations of an erythematous and pigmentary character.

The disease has been recognized for almost two centuries, but it is only within recent years that the affection has attracted much attention in the English-speaking countries. Endemic in Italy, Spain, Egypt, and the Tyrol, small epidemics have occasionally occurred in various other parts of the world, particularly in the southern United States.

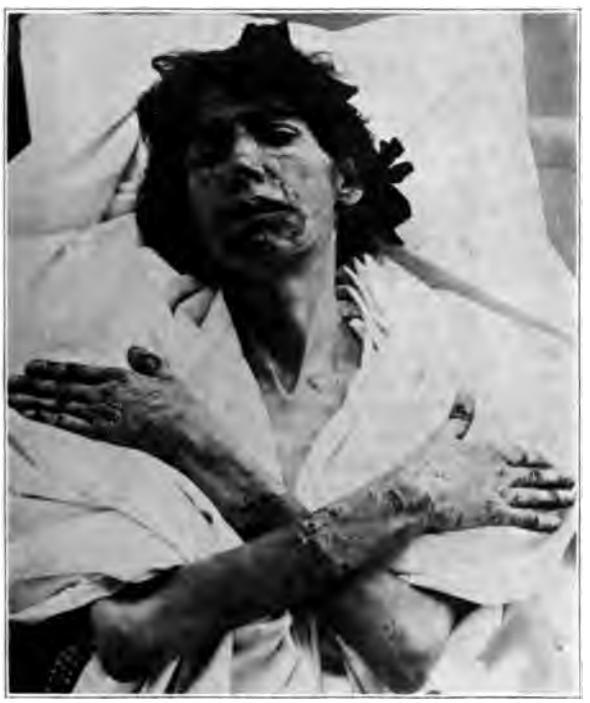

Fig. 40.—Pellagra, in advanced stage. (Courtesy of Dr. M. C. Stone.)

Symptoms.—The arrangement of the lesions is generally characteristic. In the majority of instances the dorsal surfaces of the hands and wrists, and some part of the face, scalp or neck are involved. In a considerable percentage of the cases lesions also develop on the arms and chest. In the European cases the feet and ankles are frequently affected, but in this country these parts and the palms usually escape. Colpitis, and dermatitis in the vulvar region are comparatively common. The arrangement of the eruption is al-

ways symmetrical. The earlier lesions are large, light or dark red, clearly defined macules which soon coalesce and form patches that closely resemble dermatitis from sunburn. Desquamation commences in from one week to a fortnight, and a roughened, scaly surface results. In some cases there is more or less pigmentation, although occasionally the affected areas are whiter after desquamation than before the attack. In very acute cases bullae may form, and these frequently become infected with pyogenic organisms. True cutaneous

Fig. 41. - Pellagra, showing typical facies.

atrophy is rare. Sunlight undoubtedly influences the location of the lesions in many instances. The cutaneous manifestations in pellagra are never serious in themselves, and are of but little value from the standpoint of prognosis, but as a factor in diagnosis they are invaluable. Owing to the ill-defined character of the associated symptoms arising from the gastrointestinal and nervous involvement, it is probable that the vast majority of cases of pellagra would go unrecognized if it were not for the presence of the skin lesions, which are typical and distinctive. Symptoms referable to the gastrointestinal

tract are generally present, but vary much in degree. The tongue is usually swollen, dry and denuded, and both it and the buccal mucosa may present yellowish, superficial sloughs. In the milder cases, the tongue may be redder and smoother than normal, particularly at the tip (the "bald tongue" of Sandwith). Diarrhea is commonly, but not invariably, present. In some instances, however, there may be constipation, or even constipation alternating with diarrhea. The stools have often a peculiar, foul odor, apparently resulting from putrefactive changes in the intestines, and frequently

Fig. 42.—Pellagra. Second attack. Showing characteristic pigmentation and exfoliation.

contain mucus and undigested food. The emaciation and general weakness correspond in the main with the severity of the gastro-intestinal symptoms. The course of the disease is variable. It may end with the termination of one acute attack (generally coming on in the summer time or early fall, and lasting a month or more), or it may recur during each of several successive summers. The nervous system may exhibit evidence of a central neuritis, but characteristic changes of any kind are seldom demonstrable until the final stages of the disease. Generally speaking, the mental symptoms are

similar to those occurring in chronic exhausting diseases, and in various toxic states.

Etiology.—No age or class is exempt, although mature and elderly persons of the peasant and laboring classes are the most frequent victims of the disease. The chronic insane are especially susceptible. The exciting cause is unknown. Although generally attributed to the eating of diseased or fermented maize, it sometimes occurs in localities where maize is practically unknown, or at least has never been used as a food. On the other hand, in many districts where

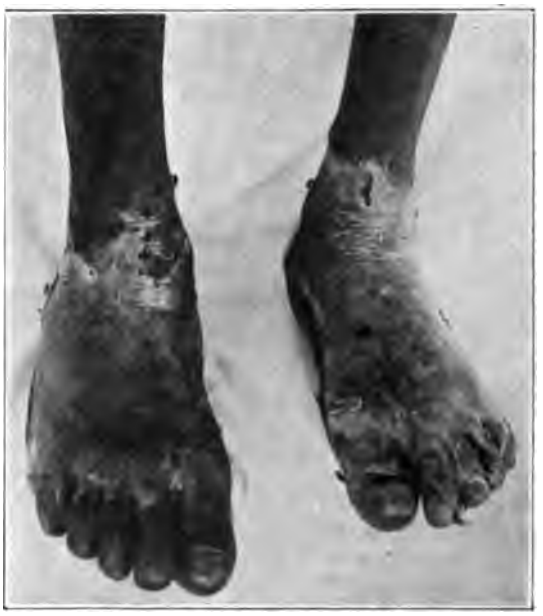

Fig. 43.—Pellagra, showing marked involvement of skin on dorsal surface of feet. (Courtesy of Dr. C. H. Lavinder, U. S. Public Health Service.)

maize is extensively cultivated and freely eaten, pellagra has never occurred. The corn feeding experiments of Nichols and Watkins gave practically negative results, and it is exceedingly probable that an extensive corn diet does not favor the production of the disease. Hirschfelder's anaphylaxis experiments (both fresh and spoiled corn being employed) likewise proved fruitless. Animal inoculations with all manner of fungi grown on both spoiled and good corn have failed to result in the production of any symptoms of pellagra (Ormsby). Siler and Nichols at first believed that the disorder

might be the result of infection with a protozoa, largely because of the widespread prevalence of amebiasis in many pellagrous districts, but later abandoned the idea. Complement fixation tests have proved negative (Waugh). Ormsby believes the disease to be due to infection with some living microorganism. The results of Goldberger's recent experimental studies indicate that insufficient proteid in the diet is an essential etiologic factor.

Fig. 44.—Pellagra, showing typical distribution of lesions. (Courtesy of Dr. C. H. Lavinder, U. S. Public Health Service.)

Pathology.—The blood and urine show nothing distinctive. There are no qualitative changes in the white count. The postmorten findings are those of a generalized intoxication. There is fatty degeneration of the liver, and inflammation of the intestinal mucosa, but nothing of a specific nature has been found either in this region or in the nervous system. The cerebrospinal fluid shows no change, and cultures are uniformly sterile.

Diagnosis.—The disorder might be confused with certain forms of dermatitis, erythema multiforme, and pseudopellagra (a rare condition sometimes found in chronic alcoholics suffering from polyneuritis). As Knowles has said, the three d's (dermatitis, diarrhea and dementia) are usually necessary for a diagnosis, although the last two are not absolutely essential. Occasionally the mental symptoms are comparatively mild. In two young women, one a stenographer, the other a teacher, recently under my care, the mental condition was stuporous and apathetic. Although ambulant, and capable of

Fig. 45.—Pellagra, showing extensive involvement of the skin in a semi-moribund patient. (Courtesy of Dr. M. C. Stone and Dr. O. L. Castle.)

caring for themselves fairly well, they would frequently start down town and either go to sleep on the street car and be carried past their destination, or else languidly climb into the wrong car and not come to their senses until something unusual happened to arouse them, or until the end of the line was reached. Neither presented gastrointestinal symptoms other than the usual feminine constipation habit, although the stenographer grew gradually worse, and died of the disease a few months later.

Prognosis.—The prognosis in pellagra is bad. Of the 258 cases occurring at the Peoria State Hospital, practically 50 per cent died.

Untoward signs are early and marked gastrointestinal and cerebrospinal involvement.

Treatment.—The hygienic surroundings of the patient are to be improved, if possible. Plentiful amounts of easily digested, nourishing food are essential. Tonics are indicated, and arsenic in particular appears to influence the course of the disease favorably in some instances. Fowler's solution, atoxyl, neosalvarsan, and salvarsan have been employed by various men. Dyer strongly recommends quinine hydrobromide. In mild cases he gives from two to ten grains (0.12 to 0.6) three times a day. Nice, McLester and Torrance found

Fig. 46.—Pellagra, showing sharp line of demarcation between affected and normal integument. (Courtesy of Dr. C. H. Lavinder, U. S. Public Health Service.)

Fig. 47.—Pellagra showing characteristic pigmentation.

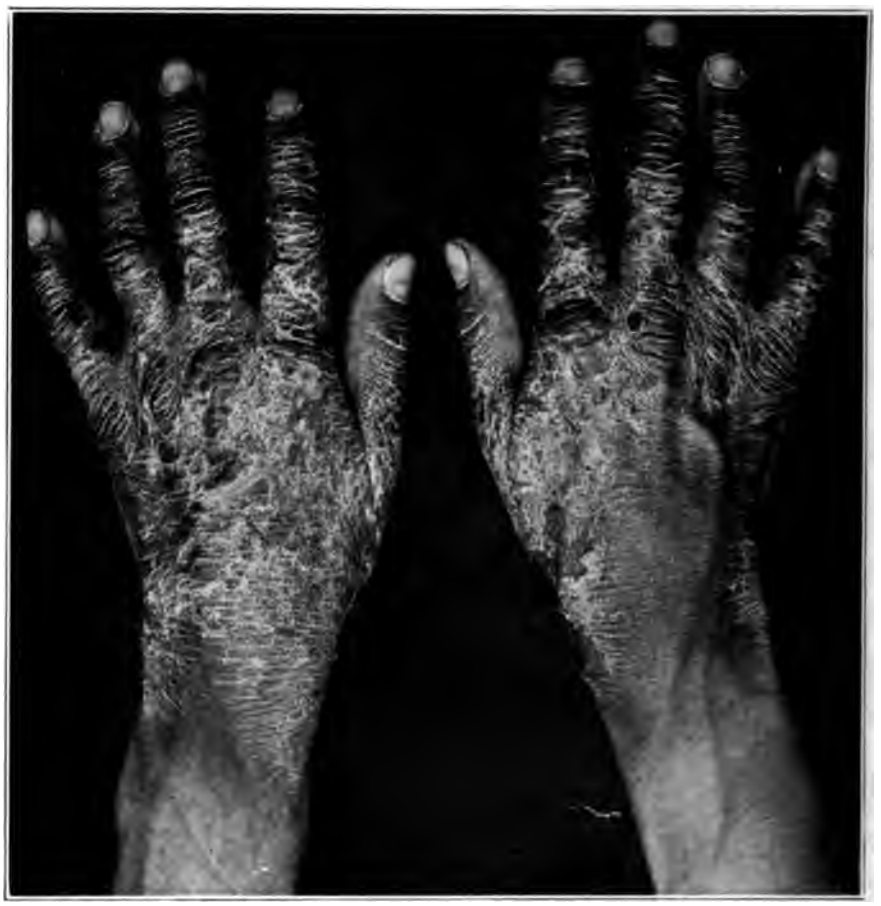

Fig. 48.—Pellagra, showing characteristic lesions on hands. Buffalo case. (Courtesy of Dr. Grover W. Wende.)

Fig. 49.—Transverse bands on finger nails in pellagra; an unusual manifestation. (Courtesy of Dr. W. C. Brownson.)

arsphenamine apparently curative in three cases. I can add four more cases to this list, although the remedy proved a miserable failure in a fifth case in which it was tried. I have found the older preparation far superior to neoarsphenamine in this disease, as in lues, and the benefit appears to result from the tonic effects of the drug rather than from any parasiticidal effect that may be exerted. The cutaneous lesions give rise to no subjective symptoms, and require no treatment, other than daily applications of calamine lotion or a bland oil.

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GRANULOMA ANNULARE.

Synonyms.—Ringed eruption; Lichen annularis; Erythema elevatum diutinum; Helodermia simplex et annularis.

Definition.—Granuloma annulare is a chronic inflammatory disease of the skin characterized by deep-seated, whitish or pinkish, flat topped nodules which spread peripherally and form circular and crescentic lesions.

Symptoms.—The disorder usually develops slowly, the first clinical manifestation being a localized, deep-seated infiltration of the skin, without appreciable reddening. It is doubtful if the ring-like lesions develop as such, but rather result from the central involution

or peripheral extension of a primary nodule. Crescentic or circinate groups of nodules frequently fuse laterally, giving rise to beaded crescents and rings. Occasionally the nodules coalesce and form plaques of various shapes and sizes, and the central portion of these lesions may then undergo involution, and partial or complete rings be formed. The mature lesions are white, pink or, rarely, purplish in color, slightly raised, and of a firm or doughy consistence. The sites of predilection are the sides of the fingers and backs of the hands, although the wrists, feet, ankles, neck, knees, and buttocks may

Fig. 50.—Granuloma annulare. (Courtesy of Dr. Ernest Dwight Chipman.)

be affected (Little), and Stillians exhibited before the Chicago Dermatological Society in 1917 a case in which only the elbows were involved. The lesions are usually few in number, and vary from 0.5 to 5.0 cm. in diameter. On superficial examination the central portion of the rings appears normal, but if a strong lens is employed, atrophic changes may often be noted.

In 1894, Crocker and Williams described a new and chronic dermatosis of unknown nature, which was characterized by the occurrence of dense, pea- to bean-sized, sharply circumscribed, convex nodules, and to which they gave the name *erythema elevatum diutinum*. The

lesions were not definitely arranged in the cases described, but judging from their histologic character it is exceedingly probable, as Hartzell suggests, that the affection is closely related to, if not identical with, granuloma annulare.

Fig. 51.—Granuloma annulare, showing typical lesions on the hand of a five-year-old girl.

Fig. 52.—Granuloma annulare. Lesions were located on dorsal surface of hands and on ear. (Courtesy of Dr. Ernest Dwight Chipman.)

Etiology.—The cause of granuloma annulare is unknown. It is comparatively a rare disorder. It occurs most frequently in children, and develops oftenest during the summer months. Little is in-

clined to the belief that it is tuberculous, but of the fifty-one cases reported to date, there has been a family history of tuberculosis in only five, and in but a single instance could definite signs of tuberculosis be found in the patient himself.

Pathology.—The pathologic alterations are confined exclusively to the corium. There is widespread cellular infiltration (lymphocytes, polynuclears, epithelioid cells and spindle cells of the connective tissue type) in the subpapillary regions, and in the majority of the older

Fig. 53. - Granuloma annulare, showing location and character of cellular infiltrate and central necrosis. (Courtesy of Dr. M. B. Hartzell.)

lesions necrosis occurs in the center of the infiltrated areas. Both the elastic and the collagenous tissue in the perinecrotic regions stain fairly well, but as the central portion of the involved area is reached the fibers become granular and fragmented, and lose their sharpness of outline. The exudate is greatest in the vicinity of the blood vessels and coil glands and ducts. Hartzell found neither plasma nor giant cells in the specimens he examined.

Diagnosis.—Granuloma annulare is to be differentiated from lichen planus annularis hypertrophicus. The latter is characterized by the dark red or violaceous color of the lesions, the frequent concomitant presence of typical lichen planus papules elsewhere, and the occasional attacks of intense itching. Not infrequently a biopsy is required in order to clear up the diagnosis. One such instance has come under my observation.

Prognosis.—The disorder is an essentially benign, though chronic, one. The lesions may persist for months, or years, and then disappear spontaneously, but termination in this manner is the exception and not the rule. The nodules never break down or ulcerate, and when they do disappear they leave no trace.

Treatment.—Varney and Jamieson secured good results from the administration of arsenic. Hartzell and C. J. White speak favorably of the x-ray, and I have found it an efficient agent in this disease, although the lesions are liable to recur after its use. In some instances, thorough freezing with carbon dioxide snow (40 seconds, under moderate pressure) will cause the nodules to disappear.

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PRURIGO.

Synonym.—Strophulus prurigineux (Hardy).

Definition.—Prurigo is a chronic inflammatory disease of the skin, beginning in early infancy, and characterized by constantly recurring, discrete, whitish or pinkish, intensely itchy papules which exhibit a predilection for the extensor surfaces of the limbs.

Symptoms.—There are two clinical varieties of the disorder, *prurigo mitis* (Willan), a comparatively mild type, and the one generally seen in America, and *prurigo ferox* or *prurigo agria* (Hebra), a very severe type, which is extremely rare in this country and in Great Britain, but relatively common in Austria. The disease usually begins in infancy, or early childhood, as a papular urticaria which persists for several weeks and is followed by the appearance of the typical pale, pinhead-sized papules. The presence of intense pruritus is a characteristic feature from the very beginning. The anterior

surfaces of the shins and the extensor surfaces of the forearms are commonly involved first, later the eruption may become more or less generalized, but the face and the flexor surfaces generally remain free to the last. The hair is dull and lusterless. The skin becomes dry, harsh, rough, thickened, and excoriated as a result of repeated scratching, and eczematous manifestations may mask the true nature of the disorder. Secondary staphylococcic involvement is not infrequent, and furunculosis may result. The inguinal, axillary and epitrochlear lymphnodes are palpable, even during the quiescent periods. As a rule, the general health is not seriously affected; although the long-continued suffering and loss of sleep generally combine to render the patient haggard and wan.

Etiology.—The disease occurs oftenest in males (two to one), and lack of proper food and proper hygienic surroundings are important supplementary factors. The exciting cause is unknown. Hebra claimed that the affection always began in infancy, but Ehlers, in

Fig. 54.—Prurigo. (Courtesy of Dr. Arthur E. Hertzler.)

an analysis of over 200 cases, found the extremes were from a few days to twenty-nine years. The Hebrew race is more frequently affected than any other.

Pathology.—The essential lesion in prurigo is the papule. It is probable that it always develops on an urticarial base. The dermal vessels are enlarged, and their walls are greatly thickened. There is spastic contraction of the arrectores pilorum, and the hair which occupies the center of the majority of the papules, if not torn out, is erected. There is a slight degree of acanthosis, with minute cavities filled with degenerated prickle cells in the rete. Leloir claimed that these tiny vesicles communicated with the coil gland outlets, but this Unna denies. Hyperkeratosis is the rule.

Diagnosis.—The affection is to be differentiated from urticaria papulosa, eczema, particularly eczema in xerodermatous subjects, and pruritus following infection with animal parasites. In some cases of papular urticaria, time alone can be relied upon to clear up the diag-

nosis, but in the majority of instances the urticarial lesions respond favorably and with a fair degree of promptness to treatment. The same is true of eczema, and this, together with the flexural localization of the eczematous lesions, should prevent confusion.

Prognosis.—Ehlers considers a certain percentage (about one in six) incurable from the first. In the majority of instances an attack can be cleared up in the course of a few weeks, but as a rule remissions occur, and the prognosis should always be guarded. The adult cases are less promising than those occurring in infancy and childhood.

Treatment.—The treatment is both constitutional and local. The most important systemic measures are hygienic; nourishing food, cod-liver oil, and sanitary surroundings, with plentiful amounts of fresh air. Iron and similar tonics are always indicated. Arsenic is apparently of little value. Locally, carbolic acid, tar and similar antipruritics, incorporated in lotions or, preferably, in ointments, are to be advised. In Vienna, great dependence is placed on ointments containing betanaphthol (2 to 5 per cent), and in sapo viridis, salicylic acid and similar keratolytics. It is probable that the x-rays or radium would prove both soothing and curative in some instances.

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PRURIGO NODULARIS.

Synonyms.—Lichen obtusus corneus; Tuberosis cutis pruriginosa.

Definition.—Prurigo nodularis is a chronic inflammatory disease of the skin characterized by several or more discrete, firm, nodular, persistent, intensely itchy tumors which are usually scattered over the legs and arms, very rarely, the trunk.

Symptoms.—In 1880, Hardaway described a peculiar case of "multiple tumors of the skin accompanied by intense itching," in which the lesions had been present twenty-two years. The patient's general health was unaffected, and the cause of the disease was problematic. During the past three decades, a dozen or more examples of the disorder, all bearing a striking clinical resemblance to Hardaway's case, have been reported under various names. A few of the patients gave histories of urticarial attacks, but this was not typical, and no direct relationship between the transient disorder and the persistent one could be traced. Nearly, if not all, of the patients have

been women, between the ages of twenty-five and fifty, and the lesions, which were pea- to hazelnut-sized, smooth, scaly or verrucose nodules, were irregularly scattered over the lower and upper limbs, and were accompanied by intense itching. The onset of the disease is usually gradual, extending over a period of weeks or months, and the affection is an exceedingly chronic one. In the majority of instances the earliest lesions are papular, but in a few cases erythema, followed by vesiculation, has preceded the development of the characteristic nodules. In a considerable percentage of the cases that have been reported, removal of the growths has been followed by recurrence. The tumors vary in number from thirty to sixty, or more, and seldom coalesce. In some respects they resemble clinically the lesions of

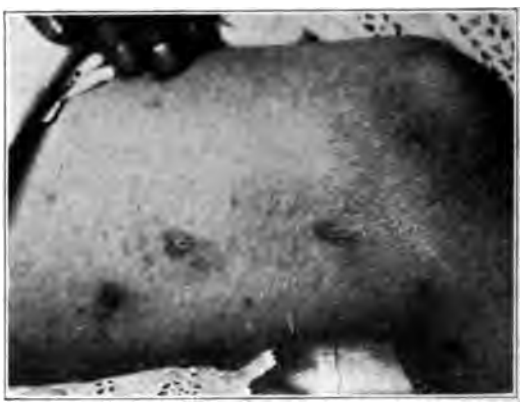

Fig. 55.—Prurigo nodularis.

lichen planus hypertrophicus, but are much less extensive. When fully developed, they often remain stationary for years.

Etiology.—The cause of prurigo nodularis is unknown. In many respects the condition resembles Brocq's "pruritus with subsequent lichenification," and it probably belongs in this class of dermatoses.

Pathology.—Histologically, White found hyperplasia of the epidermis, with signs of lateral compression and attenuation of the cells of the palisade layer, and nuclear vesiculation in the interpapillary regions. At the summits of the papillae the rete was reduced to a comparatively few layers of much altered cells. In the higher levels the lateral compression was not so great, and the constituent elements were more nearly normal, although the reaction to the various tinctorial agents was changed throughout the prickle layer. The granular stratum was markedly affected, oval cavities, with central or

peripheral, exceedingly minute, granular masses taking the place of the usual protoplasm and nuclei. The stratum corneum was composed of layer upon layer of densely packed or reticulated cells which were free from nuclei, blood cells and bacteria. The papillary layer was highly accentuated, with distended but empty lymph spaces, and

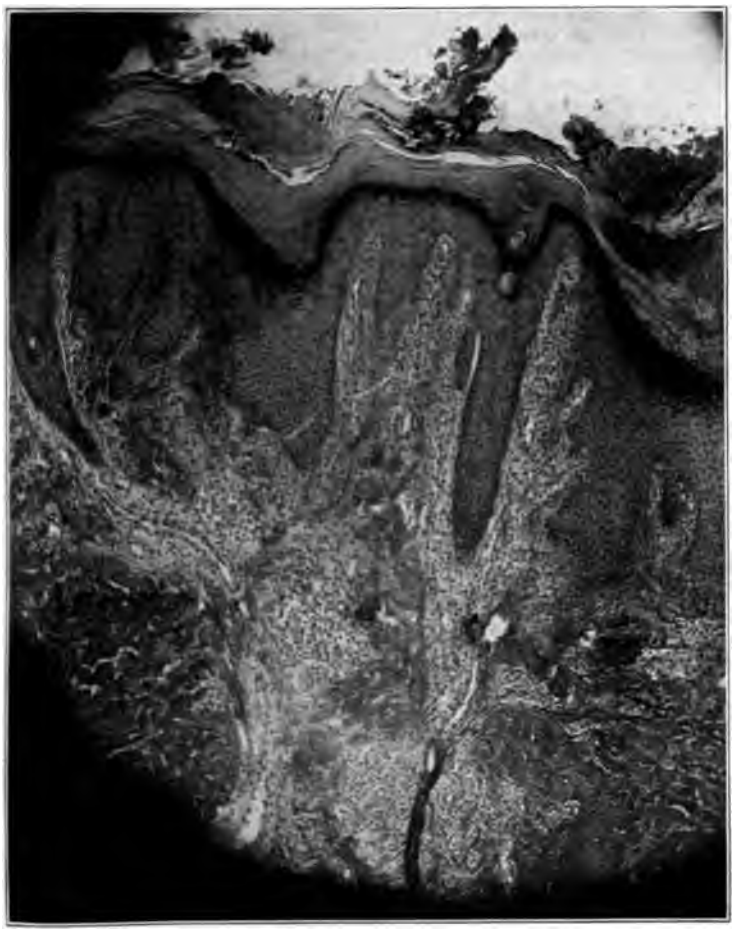

Fig. 56.—Prurigo nodularis. Moderate magnification. Section stained with hemotoxylin-eosin.

dilated and tortuous capillaries. In the neighborhood of the subpapillary blood vessels were dense, isolated masses of round cells which resembled lymphocytes. The collagen bundles were rather swollen and somewhat granular, but connective tissue nuclei were not numerous and interstitial infiltration was absent. The adnexa of the skin,

when present, were normal with the exception of the nuclei of the coil glands, which were somewhat vesicular and showed an unusual amount of granulation. In Johnston's case, Professor William H. Welch found marked cellular infiltration about the nerve trunks in the affected areas, and it has been suggested that this involvement might account for the intense pruritus which is so characteristic a feature of the disease.

Prognosis.—Permanent relief should never be promised, but much can be done to alleviate the discomfort and, as a rule many of the lesions can be successfully eradicated.

Treatment.—Johnston's case showed some improvement under arsenic. Zeisler and Stelwagon secured temporary betterment from the use of chrysarobin and Röntgen therapy, and White found applications of chrysarobin and lactic acid helpful. In my case, thorough and prolonged freezing with carbon dioxide snow proved the most satisfactory. The reaction was quite severe, and the lesions healed very slowly, but the ultimate results were comparatively good. Many of the tumors recurred, and were frozen a second time. Of the thirty or more that were present at first, less than half a dozen are troublesome at this time (at the end of two years). For the relief of the intense itching, Bronson's oil, which consists of 15 per cent. each of phenol and liquor potassae, dissolved in sweet oil, is valuable. Cycloform ointment (25 per cent) also is good. It is probable that radium could be employed to great advantage in the treatment of the disorder.

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LICHEN PLANUS.

Synonym.—Lichen ruber planus.

Definition.—Lichen planus is an inflammatory disease of the skin characterized by the presence of glistening, reddish or violaceous, pinhead-sized papules which are at first discrete but which may coalesce, forming rough scaly patches.

Symptoms.—The disease may be either acute or chronic. In the acute form the eruption is commonly generalized, and the outbreak, which is sudden, is accompanied by constitutional symptoms of great-

er or less severity. In the chronic, and most frequent type, the eruption may be generalized; but is usually limited to certain regions of the body. In the acute type, which is acute in onset only, the lesions develop with considerable rapidity, and the entire body may be involved within twenty-four or forty-eight hours. The papules are usually small and flat, with plain, or even indented, tops, and rounded, angular or stellate bases, although they may at first be acuminate, and later assume the characteristic planus type, as in Montgomery and Culver's case. The surface of the papule may be marked by striae or grayish puncta (Wickham), and is often capped by a thin scale. In color, they vary from a bright red to a violaceous hue, and as a rule they are intensely itchy. Their arrangement on the surface often

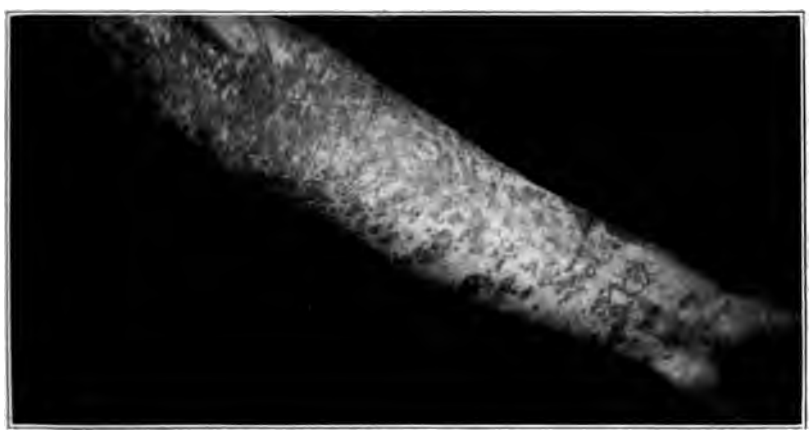

Fig. 57.—Lichen planus. In addition to papules of the usual type, numerous circinate lesions also are present.

tends to follow the natural lines of cleavage, and in the earlier stages of the disease coalescence is less frequent than in the chronic type. The acute form may merge into the chronic, or an acute attack may supervene on the chronic form. In the chronic type, the disease usually begins insidiously. The sites of predilection are the flexor surfaces of the wrists and forearms and the inner aspects of the knees and thighs. The face and scalp generally escape. As a rule, the eruption is symmetrical. On departing, the lesions, particularly if they be of long standing, frequently leave pigmented spots or even slightly atrophic scars. The disease often attacks the mucous membranes and lesions sometimes develop on the tongue, the inner surfaces of the cheeks or the glans penis, days or weeks before the gen-

eral integument is involved. In the buccal cavity and on the tongue the eruption occurs as ill-defined, whitish patches or streaks, while on the glans it may take the form of whitish points or streaks, or, if the foreskin is abbreviated, the papules may be normal in size and

Fig. 58.—Lichen planus of the tongue.

Fig. 59.—Lichen planus of buccal mucosa.

contour. Occasionally only the mucous surfaces are involved. The disease is generally a persistent one, and often tends to recur, even after apparent cure. While the descriptions here given are applicable in the majority of instances, there occasionally occur diverse

Fig. 60.—Lichen planus of glans penis.

types of the disease which may escape recognition unless one is familiar with all of the clinical aspects that this affection is capable of assuming. Probably the most frequent of the aberrant types is that in which the lesions are circular in outline, and consist of close-

ly arranged but more or less typical individual papules. Much rarer, but not less characteristic, as Cavafy, Brooke and Engman have shown, are cases in which the annular lesions develop by gradual peripheral extension from single large papules. Occasionally one encounters examples of "ringed" lichen in which both varieties are present at some time. Sometimes there is an abortive attempt at ring formation by the partial coalescence of several large, angular or crescentic, plaque-like papules. Such cases have been reported by Pringle and others, and probably represent Engman's "large ring" type. In my opinion a better designation would be "lichen planus annularis hypertrophicus."

Lichen planus linearis, the lichen planus striatus of Crocker, is fairly common in England, but comparatively rare in America and on the

Fig. 61.—Lichen planus linearis.

Continent. The most frequent type is that in which the eruption, consisting of a narrow fillet of typical papular lesions, extends from the buttock to a few inches below the knee, following the course of the sciatic nerve. Various explanations, none of which are entirely satisfactory, have been advanced to account for the peculiar distribution of the lesions in these cases. Meyer believes that the eruption occurs along Voigt's lines; in Mackenzie's case the papules appeared to have a predilection for the areas overlying recently thrombosed veins (femoral and saphenous); in Perry's case the eruption closely followed the distribution of the long saphenous nerve in one instance and the external branch of the radial nerve in the other; in one of Crocker's patients there was a band on the left thigh corresponding with the external cutaneous and anterior femoral nerves; and Pinkus and Morris have each reported a zoniform case. On the other hand, in the case shown before the Dermatological Society of the Nether-

lands, by Mendes Da Costa, in 1901, the groups of lesions were situated along the metameric segments of the skin described by Head, and there was no possible connection with the distribution of the peripheral nerves, cutaneous or subcutaneous veins, lymph vessels, or

Fig. 62.—Bullous lichen planus lesions on flexor surface of wrist.

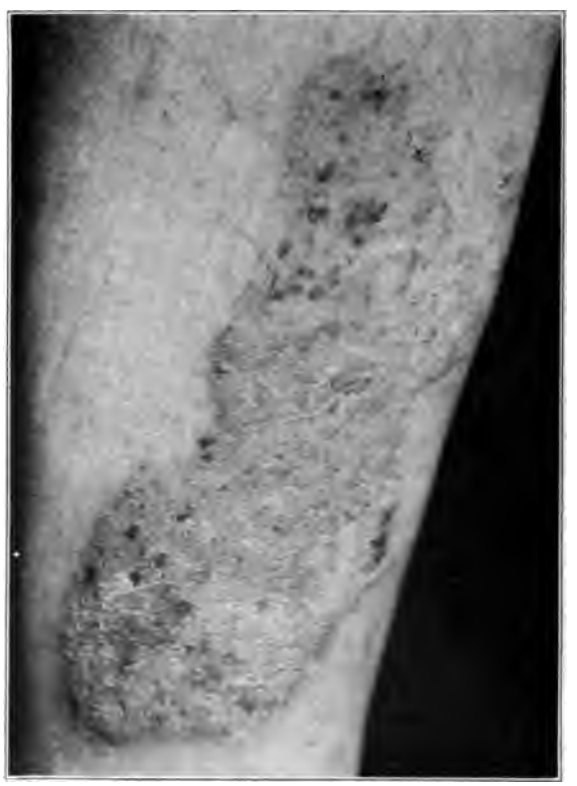

Fig. 63.—Lichen planus hypertrophicus. (Courtesy of Professor Adolph Lange.)

with the lines of Voigt. The lesions formed a linear band on the left leg, and a few were present on the right wrist. On the left leg the exanthem extended upward in two broad bands on the dorsal surface of the ankle over the anterior aspect of the lower part of the leg. Transversely over the upper third of the thigh, parallel with

Fig. 64.—Hypertrophic lichen planus of a very unusual type, "Lichen planus ocreaformis" of Lieberthal. (Courtesy of Dr. David Lieberthal.)

the groin, there was a curved band of effloreseences which extended almost around the limb.

In my opinion the most plausible explanation is found in those cases in which the eruption follows scratch-marks or other local injuries of the skin, as in the cases reported by Hallopeau and Jamier, Morris, Abraham, West, and Walters. It is a well-recognized fact that in certain systemic infections which are characterized by cutaneous

eruptions, lues for example, the skin lesions are prone to exhibit a preference for areas of lowered resistance, such as abrasions of the integument due to scratches or tattooing, bruises, or irritation arising from retained excretions or the use of tobacco.

Crocker has described an exceedingly rare type of the disease in

Fig. 65.- Lichen planus hypertrophicus retiformis.

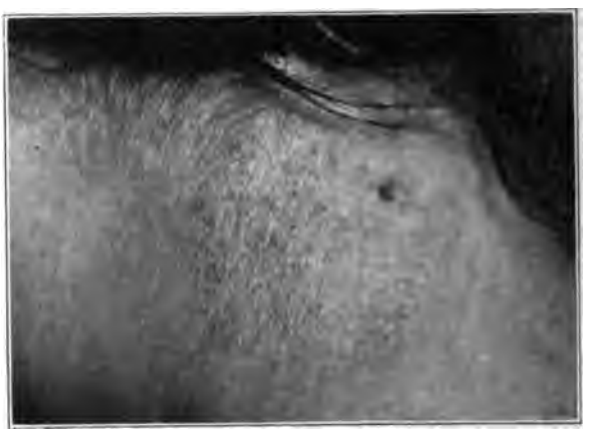

Fig. 66.—Lichen chronicus simplex.

which the lesions are of a deep crimson tint, and are very short and velvety to the touch instead of being firm and rough. The epidermis is apparently only slightly involved. He has designated the condition *"lichen planus erythematosus."*

Minute collections of serum in the prickle layer and in the papillary region are not unusual in lichen planus, and a score or more of well-defined bullous examples of the disease have been described. The fluid collects at the corio-epidermal juncture, and usually in the vicinity of a coil gland duct. The cause of vesicle formation in these cases

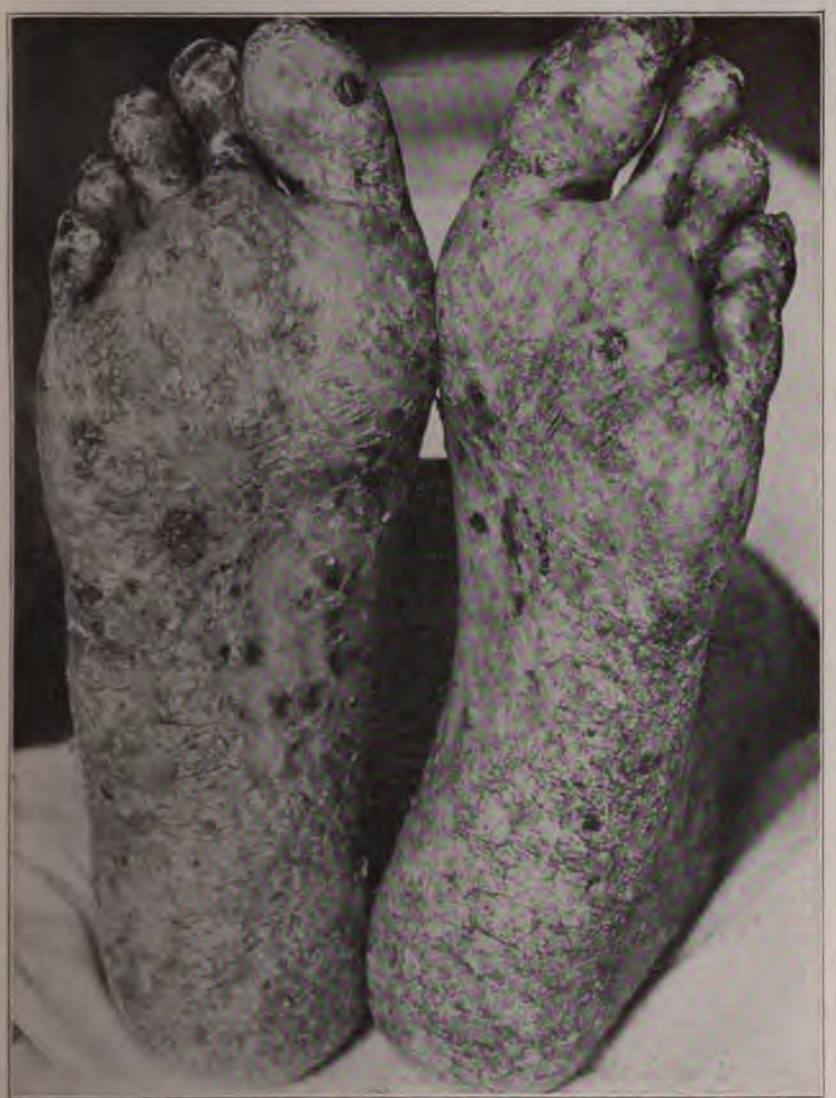

Fig. 67.—Hypertrophic lichen planus of soles. A very unusual case. (Courtesy of Dr. H. C. Varney.)

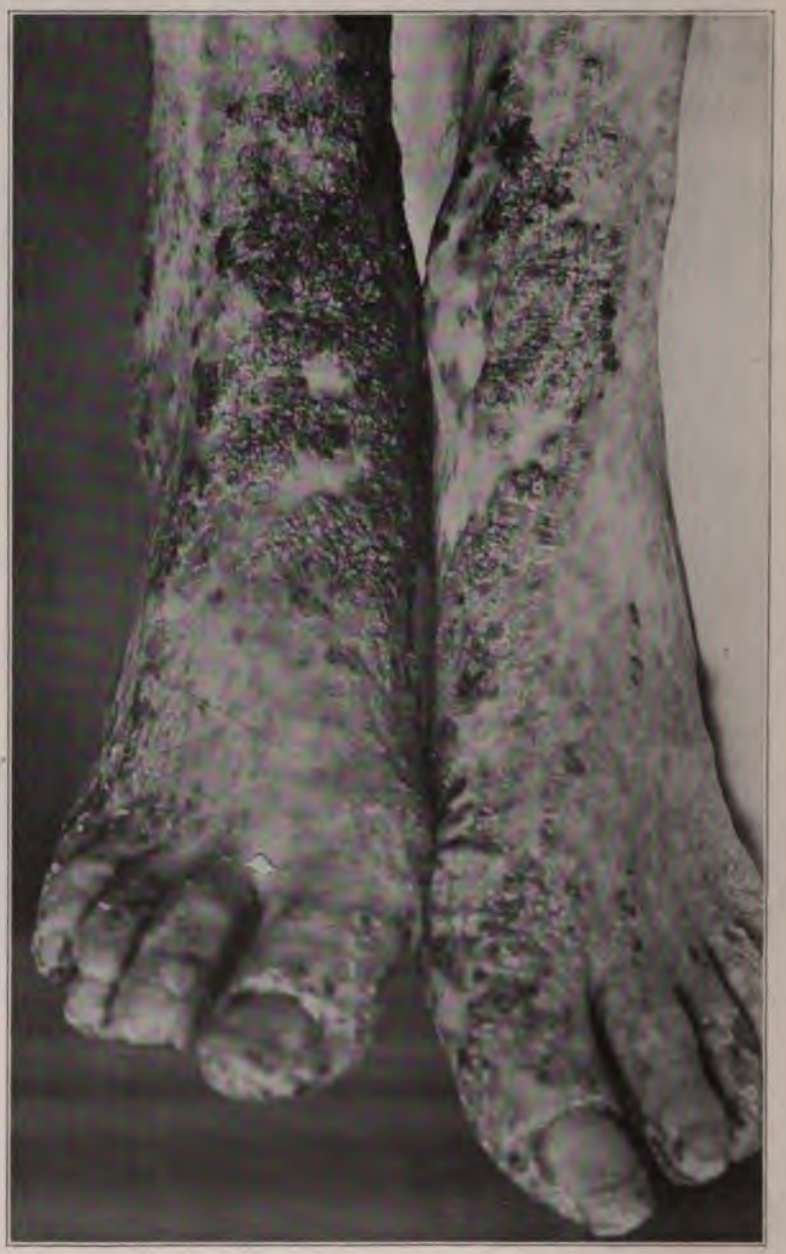

Fig. 68.—Lichen planus verrucosus. (Courtesy of Dr. H. C. Varney.)

is as interesting as it is little understood. Colcott Fox was the first to suggest that the complication might sometimes be due to arsenic. Allen believed that the outpouring of serum producing the vesicle might have some connection with a vitiated coil gland secretion. Engman holds the opinion that the development of bullae is dependent on three factors—(1) an unusual tendency to edema, (2) a very firm and non-edematous epidermis, and (3) certain degenerative changes in the elastic fibers. The occasional occurrence of suppuration, with or without subsequent ulceration, as described by G. H. Fox, is largely a matter of resistance to staphylococcic infection on the part of the patient.

Lichen planus atrophicus is a rare type in which the papules enlarge peripherally and atrophy centrally, until eventually the entire lesion thins down and only an atrophic white spot remains. Occasionally, secondary changes of a keloidal character may develop in the subjacent connective tissue, and lichen planus morphœicus (Stowers) or lichen planus keloidiformis (Pospelow) result.

Probably the most common of all the aberrant forms is *"lichen planus hypertrophicus,"* a type which has been carefully studied by Fordyce and Lieberthal in this country, Max Joseph in Germany, Crocker in England and Brocq in France. Clinically, the disorder is characterized by the occurrence of rounded or oval, isolated patches (the outer side of the leg is a favorite location), which are brownish or purplish in color, slightly elevated, rough, scaly and dry to the touch and intensely itchy. The bases are infiltrated and sharply circumscribed. These lesions may persist practically unchanged for a score or more of years. They result from the coalescence of primary papules, and usually a history of lichen planus of the ordinary type can be elicited. Not infrequently a few, or several, outstanding or satellite papules still remain.

In *lichen ruber moniliformis* the lesions are arranged in narrow bead-like bands, often running parallel with each other. Bukovsky, Gunsett, Rona and Hyde have reported such cases.

True lichen planus verrucosus is a comparatively rare type in which the lesions are acuminate or conical, with central horny projections. When coalesced they form a rough, horny, greenish or brownish patch.

Lichen planus hypertrophicus retiformis would be an appropriate appellation for another rare variety of which I have seen two instances. The most striking of these cases presented numerous large, purplish papules, with stellate bases, on the backs of the hands. The

lesions had begun as small, pin-head-sized papules many months before, and a few of these characteristic lesions were still to be found on the flexor surfaces of the wrists. The bases of many of the larger growths had coalesced at various points, giving rise to a peculiar, net-like arrangement which was quite striking. Histologically both cases presented the structural peculiarities of lichen planus eruptions, and both responded satisfactorily to the usual line of treatment.

The exact position occupied by the condition commonly known as *lichen chronicus simplex* (Vidal) has long been a disputed question.

Fig. 69.—A typical lichen planus papule. Low magnification.

Vidal would place it with the lichens, Brocq and Jacquet consider it a representation of the neurodermatoses, Stelwagon classes it with the eczemas, and Crocker and Besnier agree that the condition is not a pathologic entity, but may represent eczema, seborrheic dermatitis or lichen planus. Judging from my own observations, I believe, with Brocq and Jacquet, that the disorder is a circumscribed pruritus with subsequent lichenification. Itching without eruption is the first symptom, and the lichenification is probably a reaction which the skins of some individuals exhibit to long-continued trauma (from scratching) with ensuing subacute inflammatory involvement of the affected area

(Pusey). Clinically the eruption consists of sharply defined, round, oval or oblong, dollar-sized or larger, patches of subacute dermatitis, the surface being dry, slightly scaly, and marked into numberless little squares and diamonds by tiny criss-cross wrinkles (exaggerated surface markings). Wickham's gray points and striae are absent.

Crocker and Colcott Fox have described a type of lichen planus occurring in infants in which the eruption comes out acutely in groups, the papules being acuminate at first but later, after the removal of

Fig. 70.—Hypertrophic lichen planus, showing hyperkeratosis, and character of cellular infiltration. Specimen from margin of lesion. Moderate magnification.

the overlying scale, smooth, shiny and angular, and of a brighter red than usual. The sites of predilection are the limbs and trunk.

Etiology.—The exciting cause of lichen planus is unknown. Nervous exhaustion is the most important contributory factor. It is more frequent during active adult life than any other period. Children are very seldom attacked. Hazen discovered a spirochaete in a typical case of the disorder in 1914, and Fordyce, Montgomery and Alderson, Engman and Mook, and others have suggested that the disease may be a

systemic one, and it is quite probable that their view is correct. Chipman believes that focal infections of the teeth frequently play an important part in the causation.

Pathology.—Lichen planus papules possess typical structural characteristics which persist, although modified in degree, in the aberrant types as well. The lesion is usually penetrated by a sweat duct. The horny layer is thickened and condensed, particularly in the vicinity of the coil gland outlets, and there is a slight acanthosis, with

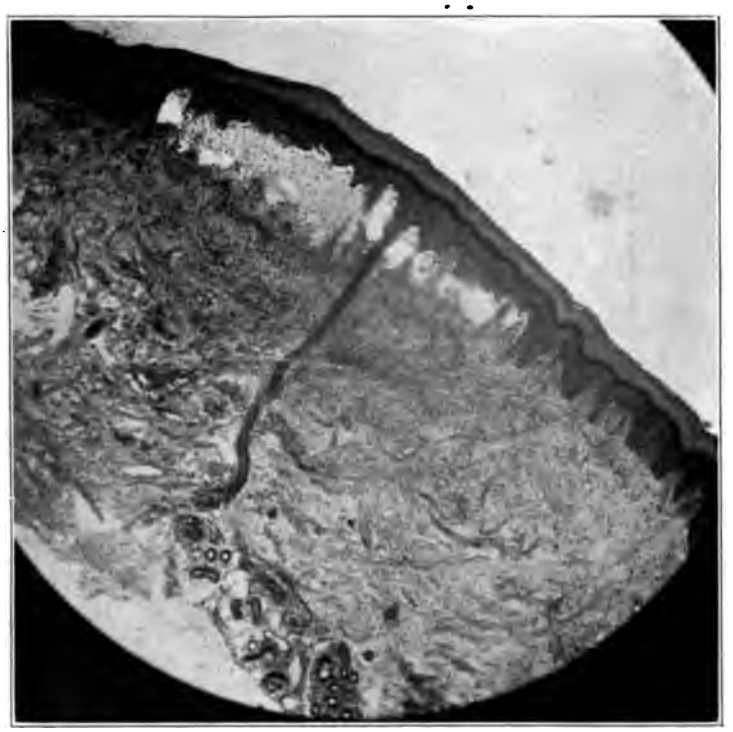

Fig. 71.—Lichen planus bullosus. Low magnification.

lateral lengthening, or stretching, of the prickle cells. The papillae are enlarged, and the intrapapillary vessels dilated. There is a dense, sharply defined cellular infiltration in the papillary and subpapillary layers. The infiltrating cells are probably a result of connective tissue-cell proliferation (Unna). Bisiadecki and Crocker believe the umbilication to be due to the tetanic contraction of the arrector pili muscles, Joseph attributes it to the absorption of pseudovesicles, and Török is of the opinion that the center of the papule is held down by

the coil gland duct. Judging from the results of my own observations, Török's explanation is the most acceptable of the three. In the hypertrophic lesions the hyperkeratosis, acanthosis, papillary hypertrophy, and vascular changes all are exaggerated, and there may be accompanying cystic-dilatation of the coil glands.

Diagnosis.—The disease is to be differentiated from psoriasis, squamous eczema, and syphilis in the papular stage. In psoriasis the

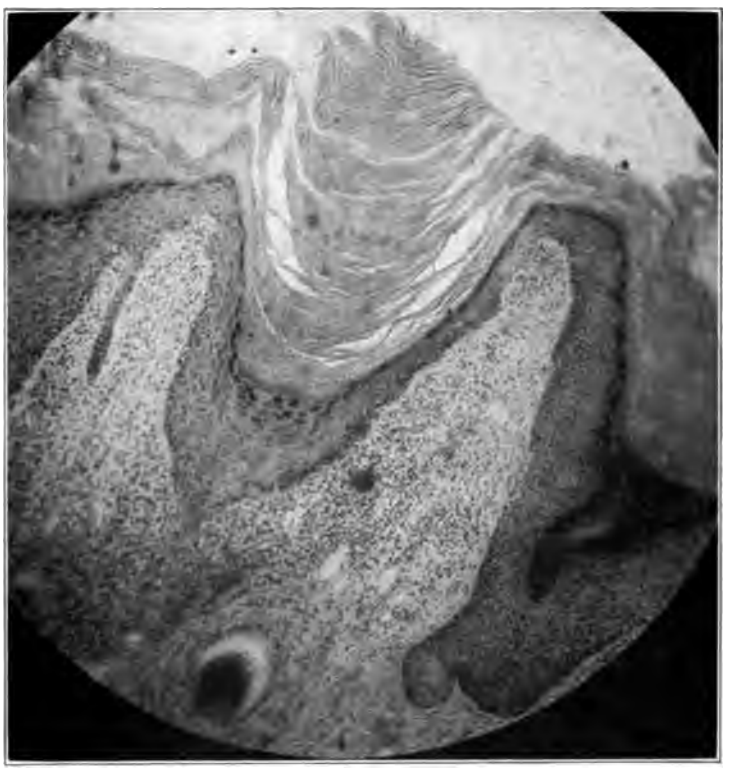

Fig. 72.—Lichen planus verrucosus. Low magnification. (Courtesy of Dr. Frederick G. Harris.)

papules are scaly from the beginning, and the scales are thicker and more abundant. Psoriatic lesions enlarge by peripheral extension, lichen planus patches are formed by coalescence. In psoriasis the knees and elbows seldom escape involvement, there are minute hemorrhagic points when the scales are forcibly removed, and itching is seldom present. In eczema there is generally a history or evidence of oozing, with more or less vesiculation. Lichen planus is a dry disease throughout its course, and some of the characteristic papules

or their stains may almost invariably be found in the neighborhood of the patch. The miliary papular syphiloderm sometimes bears a striking resemblance to the papule of lichen planus, but the color, the distribution, the absence of itching, the concomitant lymphnode involvement, and the presence of a positive serum reaction should suffice to render the diagnosis clear.

Prognosis.—Lichen planus is an exceedingly chronic disease, but one in which the results of well-directed treatment are usually very

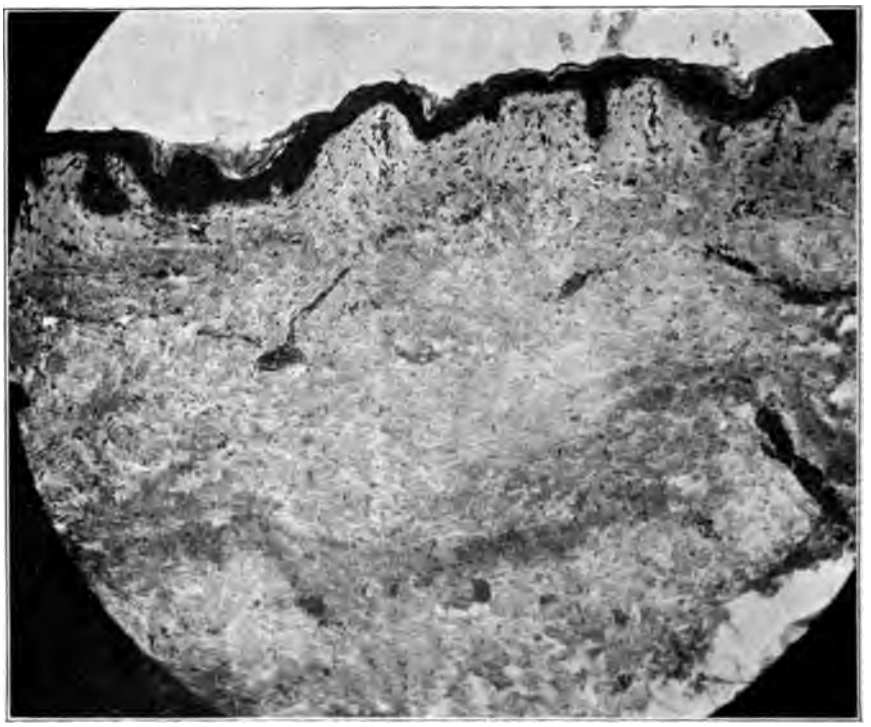

Fig. 73.—Dermatitis exfoliativa, in the late stage of pityriasis rubra pilaris. (Courtesy of Dr. Howard Morrow.)

gratifying. The hypertrophic types are the most persistent, and in dealing with them one should not be too optimistic in forecasting the possible results of treatment.

Treatment.—As Stelwagon so sanely says, "the patient is to have the benefit of good, plain food, hygienic living, and, when possible, outdoor life and freedom from mental worry or care." As a remedial agent, I have found mercury, as originally recommended by Liveing, immeasurably superior to arsenic. It is best given intra-

muscularly, in the gluteal region. Either the bichloride, in aqueous solution, the biniodide, in water or in oil, or the salicylate, in oil, may be employed. The amount administered varies with the patient, but as a rule the equivalent of 1/12 to 1/6 grain of the bichloride may be injected once daily. The salicylate is very efficient and reliable, and should always be administered in a non-mineral oil.

℞ Hydrargyri salicylatis,
Anæsthesini .....āā gr. xxx (2.0)
Adipis lanæ .....ʒ i (4.0)
Olei olivæ .....ʒ i (30.0)
Misce. Signa: Shake and inject fifteen drops (1.0) into the gluteal muscles every three days.

If it is inconvenient to give the drug in this manner, the bichloride may be given by the mouth, commencing with 1/20 grain, in a half-glass of water, after each meal, and gradually increasing the amount until the physiologic effect is secured.

In cases of the hypertrophic type the mercurial medication may be alternated, about once a fortnight, with arsenic, or, better, arsenic and iron. Alkaline diuretics, with or without small amounts of bromide to lessen cutaneous irritability, are often beneficial. The salicylates I have found worse than useless, the gastric irritation to which they give rise more than counterbalancing their possible therapeutic value. Arsphenamine and neoarsphenamine also I have tried without benefit. The local treatment is of importance. A cooling, antipruritic ointment, which is at the same time more or less curative, may be made as follows:

℞ Phenolis,
Mentholis .....āā gr. v (0.3)*
Unguenti hydragyri ammoniatis,
Unguenti zinci oxidi.....āā ʒ ii (8.0)
Adipis lanæ .....ʒ iv (15.0)
Liquoris calcis q. s. ad saturationem.
Misce et fiat unguentum. Signa: Apply freely two or three times daily.
*May be increased to gr. x (0.6) according to indications.

In addition to an ointment, it is advisable to prescribe a soothing, non-greasy application which the patient may apply at will. One of the best is ordinary calamine lotion, to which has been added from 1 to 10 per cent. of Duhring's coal tar preparation:

℞ Phenolis	♏ xv	(1.0)
Tincturæ picis carbonis compositæ (Duhring)	3 iiss	(10.0)
Zinci oxidi	3 ss	(2.0)*
Amyli pulveris,		
Calaminæ	āā 3 v	(20.0)
Glycerini	3 iiss	(10.0)
Aquæ	q. s. ad f℥ vi	(180.0)

Misce et signa: Shake and apply several times daily.

*May take from ½ to 5 drams (2.0-20.0).

If the itching is exceedingly troublesome one may resort to the following combination, for the formula of which I am indebted to a former associate:

℞ Mentholis	3 iss	(6.0)
Thymolis	3 ii	(8.0)
Chlorali hydrati	3 i	(4.0)
Chloroformi,		
Olei eucalypti	āā ℥ ii	(60.0)
Olei gaultheriæ	3 iv	(15.0)
Alcoholis	q. s. ad f℥ viii	(240.0)

This mixture is as hot as it is efficient, but I have found it of value in many intensely pruritic conditions.

For the eradication of the thick, scaly patches in lichen planus hypertrophicus, numerous methods have been suggested, none of which are entirely satisfactory. Repeated freezing with Pusey's carbon dioxide snow often is beneficial, and Röntgen therapy, in an erythema dose or less, constitutes a reliable aid. The long-continued application, under rubber or oiled silk, of ointments containing considerable percentages of salicylic acid and tar occasionally results in a cure.

In lichen chronicus simplex, C. J. White recommends an ointment composed of crude coal tar (1 part), oxide of zinc (1 part), and vaseline (16 parts). In cases of long standing, and particularly in those involving the scalp, Fordyce speaks highly of the application of a 25 per cent aqueous solution of potassium hydroxide, followed by curettage, and the liberal use of an ichthyol ointment. In my own experience, nothing gives such good results as radium. A light reaction only is required, following which the lesions usually promptly disappear.

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LICHEN NITIDUS.

Definition.—Lichen nitidus is a chronic inflammatory disease of the skin characterized by flat-topped, shiny, pinhead-sized, pinkish or flesh-colored papules, which never coalesce, and give rise to no subjective symptoms.

Symptoms.—The favorite seat of the eruption is the genital region, although the abdomen, breast, and arms sometimes are attacked. The individual papules bear a striking resemblance to those of lichen planus, but their color and distribution, and the absence of itching, are distinctive.

Diagnosis.—The disorder is to be differentiated from verrucae planae juveniles and lichen scrofulosorum. The shape, size and distribution of verrucae should serve to prevent confusion. Lichen scrofulosorum occurs in young children, often of tuberculous taint. The lesions are seated about the pilosebaceous orifices, scaling is a prominent feature, and the papules are darker in color than those seen in lichen nitidus.

Etiology.—The histological structure of the lesions is that of an infective granuloma. Arndt regards the condition as probably tuberculous in origin. In Kyrle's case and in mine, animal inoculations gave negative results.

Pathology.—The disease process is confined to the papillary region, and Kyrle and McDonagh found the cells in the affected area to be "partly conglomerated together and partly separated, the whole being sharply circumscribed. The cells were mostly epithelioid, with a few round cells interspersed, of the type of mononuclear leucocytes. These round cells lie between the epithelioid cells and are not arranged around the periphery. Giant cells of the Langerhans type are also present. In the center of the cellular mass the connective tissue appears somewhat edematous, and where the cells are widely separated coagulated edematous masses are included. In the nodule no signs

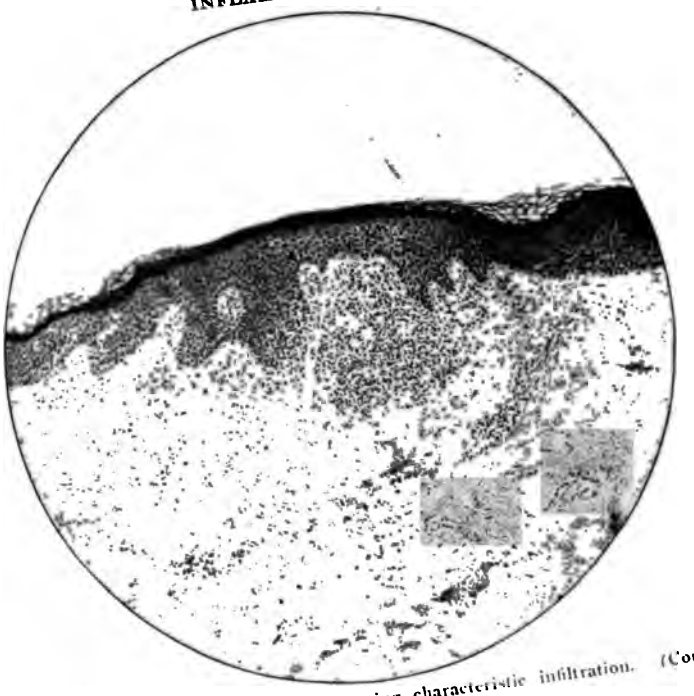

Fig. 74. Lichen nitidus. Early lesion, showing characteristic infiltration. (Courtesy of William Allen Pusey.)

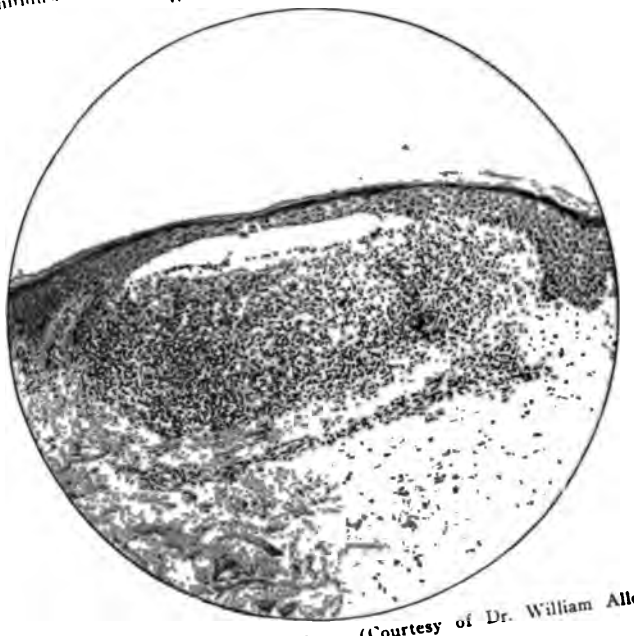

Fig. 75.—Lichen nitidus, adult lesion. (Courtesy of Dr. William Allen

of caseation are to be seen." The nodules are ball-shaped, and no processes are thrown out into the surrounding tissue.

Prognosis.—The lesions are persistent, and may remain for years without change.

Treatment.—Owing to the absence of subjective symptoms, the papules are generally discovered by accident, and treatment is neglected by the majority of patients. An ointment containing salicylic acid (5 per cent) and resorcin (5 per cent) proved curative in the case under my care.

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THE CHRONIC RESISTANT MACULAR AND MACULOPAPULAR SCALY ERYTHRODERMIAS.

Colcott Fox and MacLeod have suggested the designation of "chronic resistant macular and maculopapular scaly erythrodermias" for an ill-defined group of chronic dermatoses many of which are clinically suggestive of a double, triple or quadruple combination of psoriasis, lichen planus, seborrheic dermatitis, and early mycosis fungoides. Unna, Santi and Pollitzer have described cases under the name of "*parakeratosis variegata*," Brocq, under the general heading of "*parapsoriasis*," with three subdivisions, "*parapsoriasis guttata*," "*parapsoriasis lichenoides*," and "*erythrodermia pityriasique en plaques disséminé*," Jadassohn, under the name of "*psoriasiform and lichenoid exanthem*" and "*nodular psoriasiform dermatitis*," Neisser, under the designation of "*lichenoid eruption*," Fritz Juliusberg, under "*psoriasiform and lichenoid exanthem*" and "*pityriasis lichenoides chronica*," Boeck, under "*dermatitis variegata*," Crocker, under "*lichen variegatus*," and Civatte, under "*dermatosi squamosi anormale*," while in one of my own patients the cutaneous manifestations were suggestive of both psoriasis and lichen planus of an unusual type, and the appellation "*psoriasis lichenoides*" was suggested. The conclusions reached by Brocq regarding the characteristics of the group described by him are largely applicable to the entire contingent; the eruption is of very slow evolution, and consists of pinkish or reddish, circumscribed, sharply defined patches which vary from 2 to 6 cm. in diameter, and are scattered irregularly over the body. There is more or less fine scaly desquamation, practically

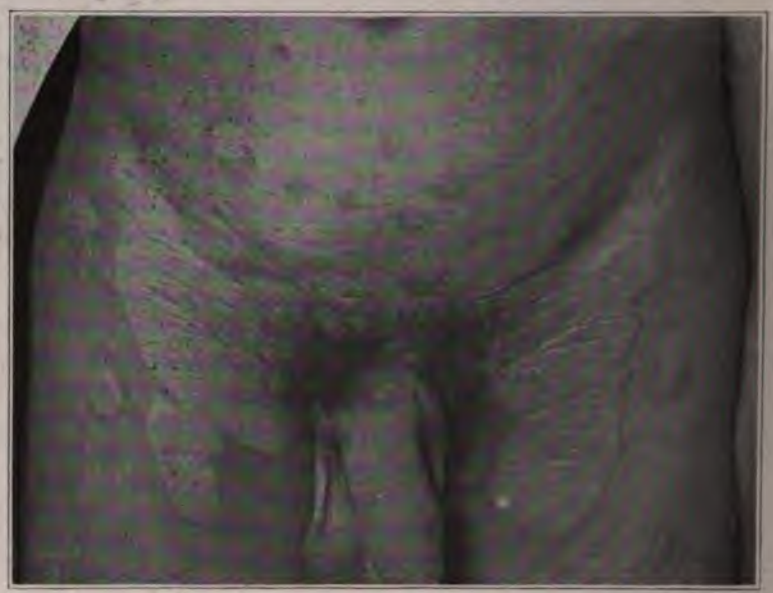

Fig. 77.—Parapsoriasis lichenoides.

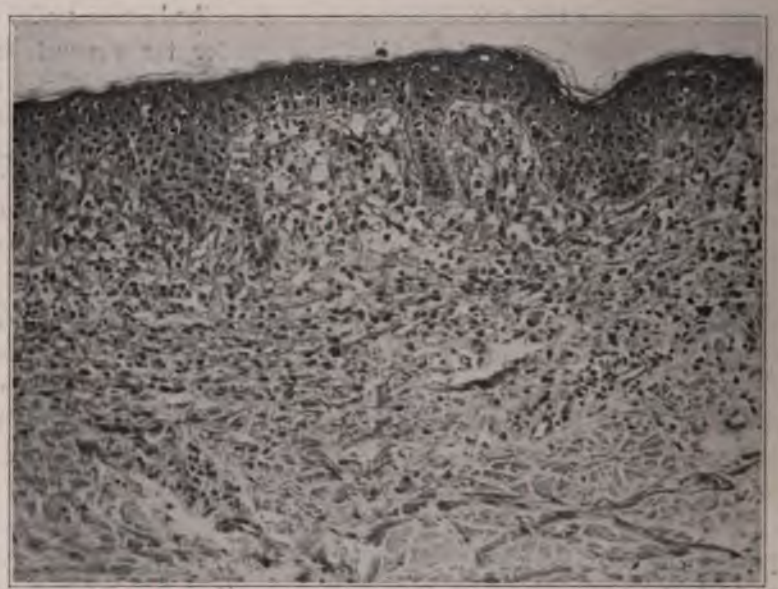

Fig. 78.—Pityriasis lichenoides chronica, showing epidermal and sub-epidermal edema, vacuolization, and round cells in pars papillaris. (Courtesy of Dr. Fred Wise.)

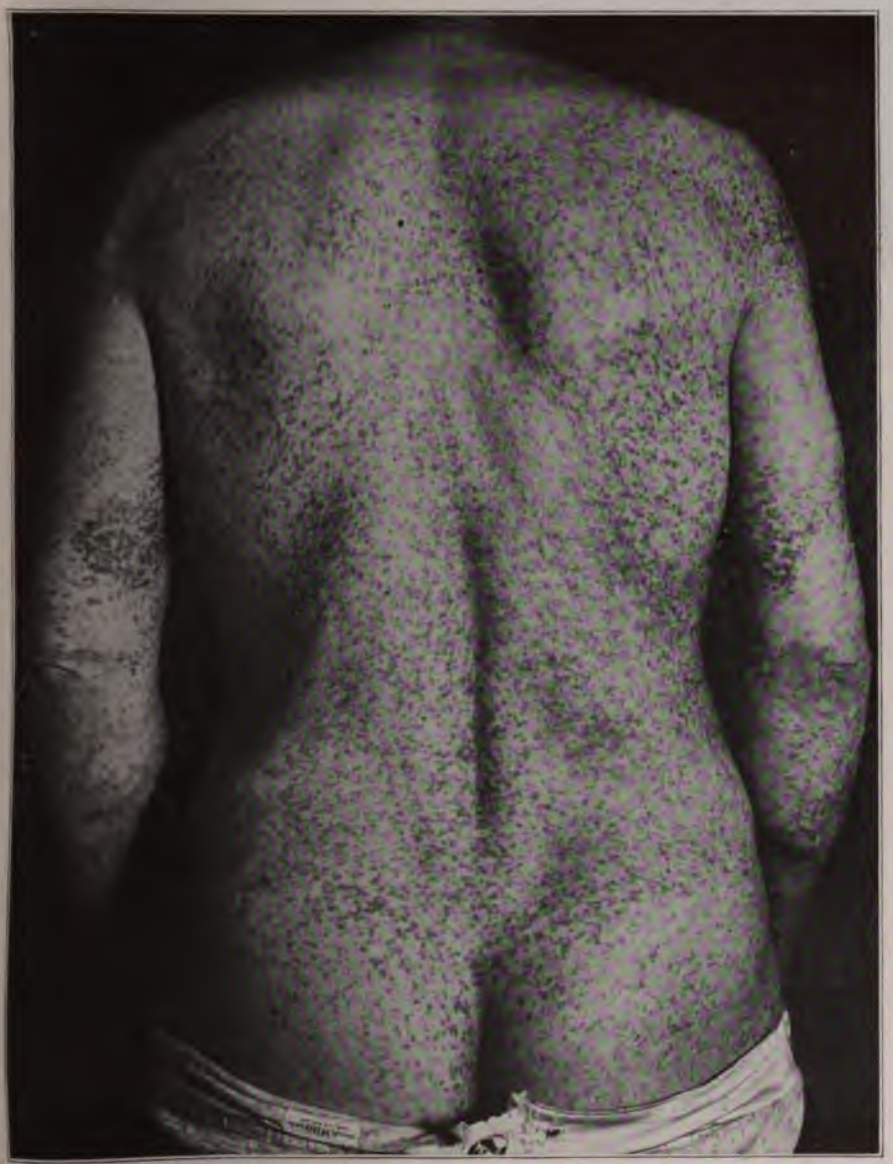

Fig. 79.—Pityriasis lichenoides chronica. (Courtesy of Dr. Fred Wise.)

no infiltration, and almost complete absence of itching. The lesions possess an extraordinary resistance to all known local applications.

Etiology.—The cause of none of the various disorders included in this group is known. The suggestion has been advanced that many,

Fig. 80.—Psoriasis lichenoides. (Courtesy of Dr. Fred Wise.)

or all, are tuberculous, but the evidence now available does not uphold this theory.

Pathology.—Histologically, dermal edema, with vascular dilatation, diminution of elastic fibers, thinning of the prickle layer, partial or complete absence of the stratum granulosum, and parakeratosis are found. The pathologic changes are seldom sufficiently distinctive,

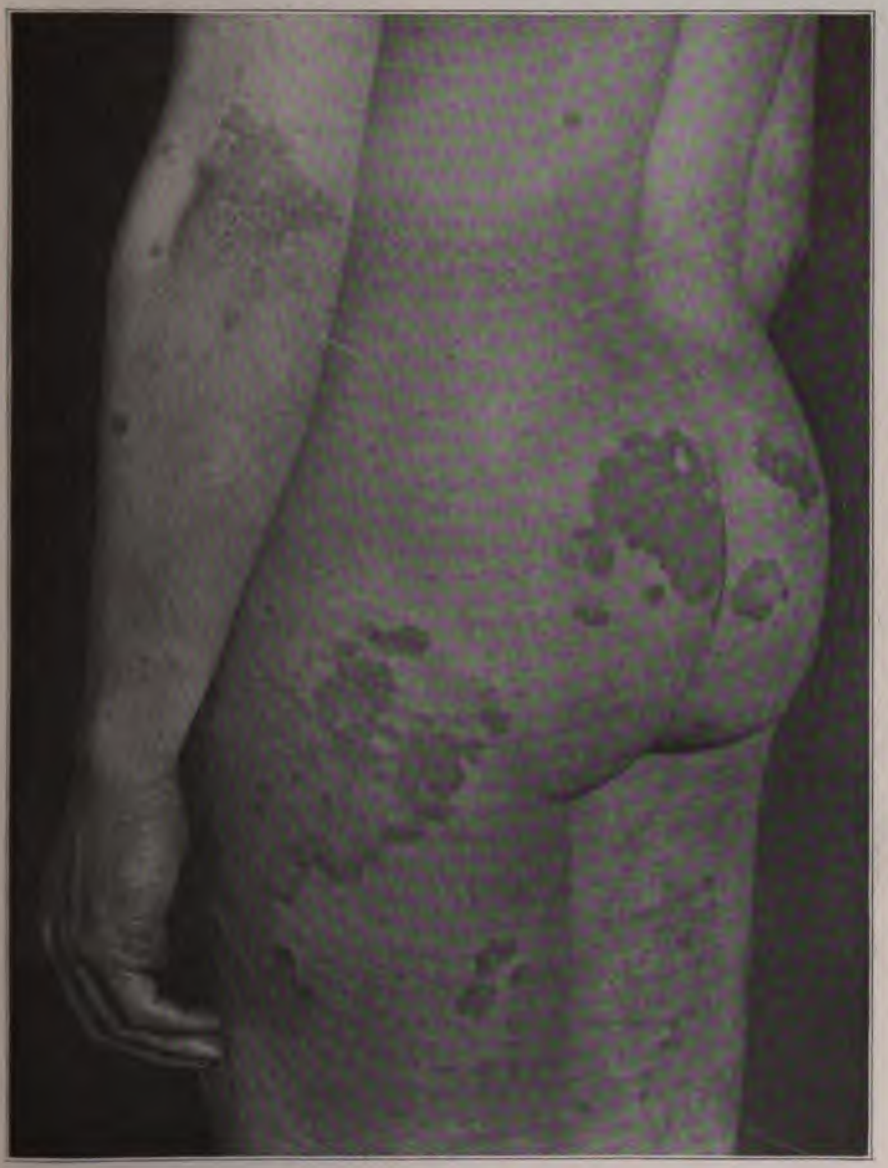

Fig. 81.—Parapsoriasis. (Courtesy of Dr. Fred Wise.)

however, to permit of the formulation of an independent diagnosis.

Treatment.—The drugs commonly employed in combating psoriasis and chronic seborrheic dermatitis sometimes prove of service, but as a rule resort must be had to pyrogallol and similar powerful reducing agents. Internally, sodium cacodylate (Brocq), arsenic, mercuric chloride (Engman), salicin, and thyroid extract have been employed.

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PITYRIASIS RUBRA PILARIS.

Synonyms.—Lichen ruber (Hebra); Lichen ruber acuminatus (Kaposi); Lichen acuminatus (Crocker).

Definition.—A chronic disease of the skin characterized by hard, yellowish, pinkish or reddish papules which are seated at the mouths of the hair follicles and coil gland ducts, and which may become of general or even universal distribution.

Symptoms.—The identity of this disorder was for many years a subject of controversy. The affection was first described by Claudius Tarral (cited by Besnier) in 1828, but it was not until the middle of the last century that the disease began to attract general attention, and for the next forty or fifty years it supplied a topic for argument at many of the larger dermatological gatherings. Devergie described the condition as "pityriasis rubra pilaris," and it has always been known by that name in France. The elder Hebra, in his description of a strikingly similar condition, employed the appellation of "lichen ruber," and his son-in-law and disciple, Kaposi, later changed this to "lichen ruber acuminatus," mainly to prevent its confusion with the "lichen ruber planus" of Wilson (our "lichen planus"). It is now generally accepted that "pityriasis rubra pilaris" and "lichen ruber acuminatus" represent one and the same disorder, and the majority of students hold that Hebra's description also applies to the same

affection. Unfortunately, all of Hebra's first cases (a dozen or more) died as a result of the disease, whereas "lichen ruber acuminatus" and "pityriasis rubra pilaris" seldom if ever prove fatal, consequent-

Fig. 82.—Pityriasis rubra pilaris. (Courtesy of Dr. Howard Fox.)

Fig. 83.—Pityriasis rubra pilaris. (Courtesy of Dr. Howard Fox.)

Fig. 84.—Pityriasis rubra pilaris. (Courtesy of Dr. William Allen Pusey.)

Fig. 85.—Pityriasis rubra pilaris. (Courtesy of Dr. Howard Fox.)

Fig. 86.—Pityriasis rubra pilaris, desquamative stage. (Courtesy of Dr. Howard Morrow.)

ly there is still room for argument. The following description applies, however, to the original pityriasis rubra pilaris as recognized by Devergie, Besnier and Brocq.

Symptoms.—The sites of predilection are the backs of the hands and fingers, particularly the first and second phalanges, the extensor surfaces of the wrists and forearms, anterior axillary folds, and the elbows and knees. The characteristic lesions are hard, dry papules seated at the mouths of the hair follicles, and each enclosing in its center a dry,

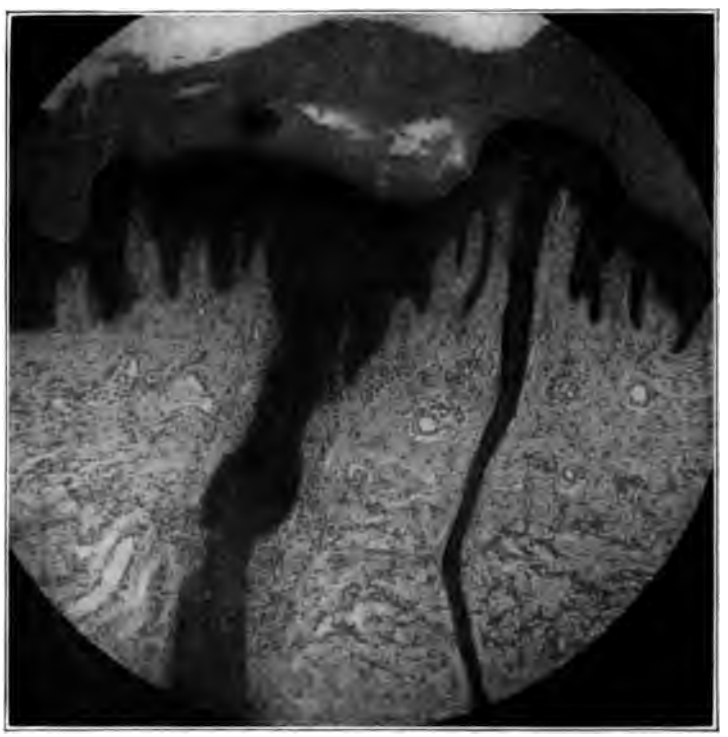

Fig. 87.—Pityriasis rubra pilaris, showing hyperkeratosis, coil gland duct involvement, and dermal changes. Moderate magnification.

lusterless, atrophied hair shaft. The horny plug extends downward into the follicle for a considerable distance. The papules are discrete at first, but tend to become confluent, involving areas of considerable extent, and giving rise to thickened, yellowish-red or grayish-red patches, which are rough, dry, and partially covered with branny scales. Deep folds, and sometimes fissures, form at the joints. The palms and soles are thickened, and the nails may become grayish, brittle and striated. On

the scalp the lesions somewhat resemble those of a long-standing, dry seborrhea. The hair in this region is not markedly affected, however. The skin of the face becomes thickened and inelastic, with more or less scale formation. Ectropion of the lower lids may be present. Itching is slight or entirely absent. In the disease, as usually encountered, there are no constitutional symptoms, and the general health is unimpaired.

Etiology.—The majority of the cases are seen in young adults, although practically no age (from two and one-half years upward) is exempt. The disease is most frequent in Austria and in France. The exciting cause is unknown.

Pathology.—There is a pronounced hyperkeratosis throughout the affected area, although the principal changes occur in the vicinity of the mouths of the hair follicles and sweat orifices. In these localities thickening is especially prominent, the outer corneous layers being those principally involved. There is some accompanying acanthosis. The papillæ are elongated, with some round and mast cell infiltration. Hartzell found fairly abundant numbers of round cells in the perifollicular regions, but no appreciable alteration of either the sebaceous or coil glands.

Diagnosis.—The character and localization of the lesions, the dry scaliness of the scalp and face, the palmar and plantar thickening, and the absence of subjective symptoms, all are distinctive. The disease might be confused with psoriasis, dermatitis exfoliativa, ichthyosis or lichen planus. In psoriasis, both the dorsal and palmar surfaces of the hands generally escape, the face is seldom involved, and the lesions enlarge by peripheral extension instead of by confluence. In dermatitis exfoliativa there is a marked erythema, with but little or no thickening, the scales are large and papery, and the onset is acute, with some attending constitutional disturbance. In ichthyosis the history alone is usually sufficient to prevent confusion. Otherwise the absence of the typical papules and of redness are distinctive. The red or violaceous color of the lesions in lichen planus and the presence of the typical papules at some stage of the disease, together with their localization and the accompanying pruritus should prevent confusion.

Prognosis.—The disease is a chronic and persistent one, rebellious to treatment, and prone to relapse, even after years of apparent freedom. Fortunately, however, fatal cases, such as were reported by Hebra, are exceedingly rare.

Treatment.—The treatment is constitutional and local. Of the internal remedies, arsenic, in the form of Fowler's solution, or sodium cacodylate (Heidingsfeld), thyroid extract (Crocker), mercury (C. J. White), pilocarpine, and the various tonics have been employed with resulting benefit. Brocq recommends sodium arsenate. Locally, alkaline, bran and starch water baths, followed by sweet oil or cocoanut oil (plain, or with 5 to 10 per cent salicylic acid added) rubs are excellent. Carron oil, containing small amounts of liquor carbonis detergens, occasionally acts well, and weak tar ointments sometimes prove valuable.

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PSORIASIS.

Synonyms.—Lepra alphos; alphos.

Definition.—Psoriasis is a chronic inflammatory disease characterized by dry, reddish, rounded or oval patches which exhibit a predilection for the extensor surfaces and are covered with whitish or grayish, silvery, imbricated scales.

Symptoms.—The disease affects both sexes and all ages. It commonly first appears in early adult life as a symmetrical eruption which involves the extensor surfaces of the limbs, particularly the elbows and knees. The primary lesion is a flat-topped papule, which quickly becomes covered with a thin grayish scale. The papules spread peripherally, and neighboring lesions speedily coalesce, so that usually by the time medical advice is sought numerous round or oval, sharply defined patches, varying from 1 to 5 cm. in diameter, are found scattered over the limbs and body. The irregular collections of silvery, mother-of-pearl scales have been likened to drops of mortar adhering to the skin, and when the lowermost layers are scraped off numbers of bright red spots, the tips of hypertrophied and inflamed papillae are exposed, owing to the thinning of the superjacent rete. These are painless, but bleed very readily. In the course of time the central portions of some of the patches may undergo regressive changes, with the formation of circinate and segmental lesions. There are no constitutional symptoms, and itching is the exception rather than

the rule. The lesions are dry throughout their course. As a rule, the patients are remarkably healthy looking individuals, and should they experience an attack of some serious intercurrent disease, such as typhoid fever, the eruption often practically disappears for a time, only to reappear as the patient's strength is regained. It is probable, however, that the prolonged rest in bed has much to do with the disappearance of the psoriatic lesions, inasmuch as ambulatory patients in a weakened

Fig. 88.— Psoriasis. The patches are of long standing and are deeply infiltrated.

physical state are particularly susceptible to severe outbreaks. Although usually slow in its development and chronic in its course, psoriasis occasionally develops acutely, with a more or less widespread, generalized eruption.. In these cases the subjective symptoms are generally more pronounced in character, and the scales thinner, fewer, and less characteristic. The scalp is frequently involved, either in small, discrete patches or in one large patch, and usually some, but not marked, hair loss results. Occasionally, as in a case reported

by Harris, the disease is confined to the scalp. The palms and nails are sometimes attacked, but the backs of the hands and fingers usually escape. On the scrotum it may give rise to redness, swelling, induration and pain. The eruption often exhibits a preference for cicatricial

Fig. 89.—Psoriasis, showing a deeply infiltrated patch on arm.

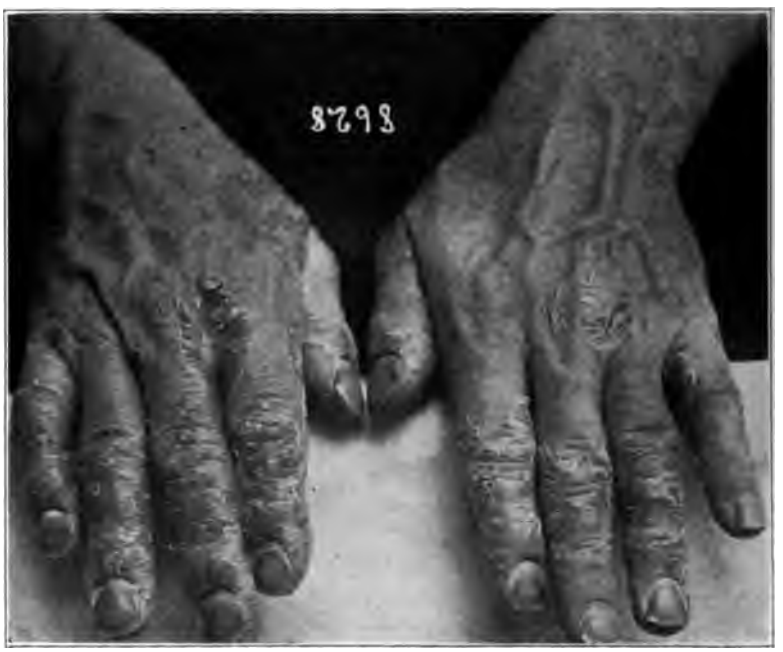

Fig. 90.—Psoriasis of hands. (Courtesy of Dr. H. C. Baum.)

and bruised or scratched areas. The mucous membranes are seldom involved. Once established, the disorder persists, with remissions and intermissions, for months or years. On disappearing, the lesions leave

no trace, unless it be a slight pigmentation of the skin (more frequent after long continued arsenical medication). In the majority of instances the eruption tends to disappear during the warmer months, and recur with the onset of cold weather. The division of the disease into various clinical varieties, according to the size and configuration of the lesions, is a needless refinement, and should not be encouraged.

Etiology.—The cause of psoriasis is not known. It is a common

Fig. 91.—Psoriasis of the palms and fingers. (Courtesy of Dr. H. C. Baum.)

disease, constituting between 2 and 3 per cent of all skin affections. Heredity is probably an important factor in some instances. Experience has shown that the disease is but slightly, if at all, infectious, and two or more cases are seldom found in a family (Knowles). Unna and Walker hold that psoriasis and seborrhea are closely interrelated, but their belief is shared by but few other dermatologists. At this time many investigators do believe, however, that psoriasis is caused by a parasite. While it is not probable that focal infections of

Fig. 92.—Psoriasis of palm.

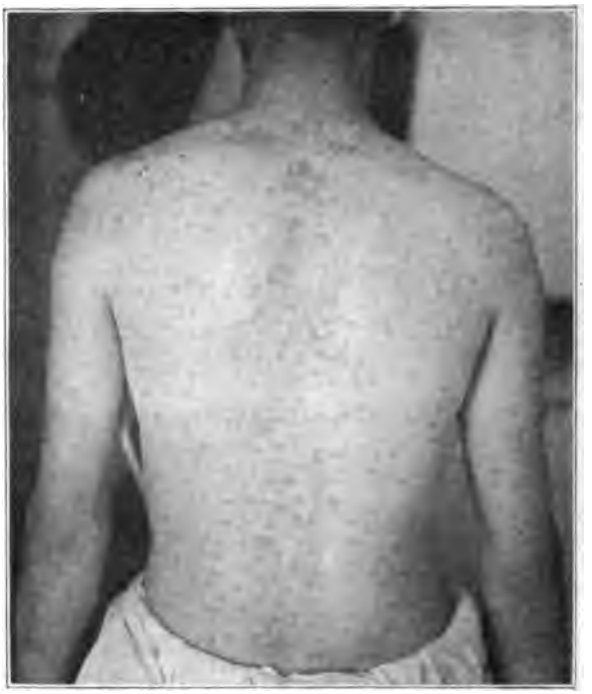

Fig. 93.—Psoriasis guttata.

the teeth and especially of the tonsils are important etiologic factors, when present, their eradication undoubtedly hastens the disappearance of the eruption under the usual methods of treatment.

Pathology.—In even the early lesions there is a considerable degree of hyperkeratosis, with thickening of the rete except in the suprapapillary regions, papillary enlargement, and dilatation of the interpapillary vessels, with more or less associated perivascular and perifollicular cellular infiltration. The inflammatory process probably begins in the

Fig. 94.—Psoriasis guttata.

papillary layer, the change in the rete being purely secondary. The rete is thickened, but only in the interpapillary regions. The vascular changes and cellular extravasation are more pronounced in the older lesions. The cellular infiltration is greatest in the vicinity of the coil gland ducts and

Fig. 95.—Psoriasis guttata.

the hair follicles, and consists for the most part of lymphocytes or small round cells. Crocker found proliferative changes in the prickle layer, particularly in sections which included the center of the psoriatic papule. Numerous organisms have been discovered and described by various observers, but none has as yet been isolated that fulfills Koch's postulates.

Diagnosis.—In the majority of instances the eruption is so typical and characteristic that confusion is hardly possible. In some cases, however, the disease might be mistaken for seborrheic dermatitis,

eczema, syphilis, tinea circinata, lichen planus or lupus erythematosus. In seborrheic dermatitis the disease almost invariably commences on the scalp as a "dandruff," and travels down the median

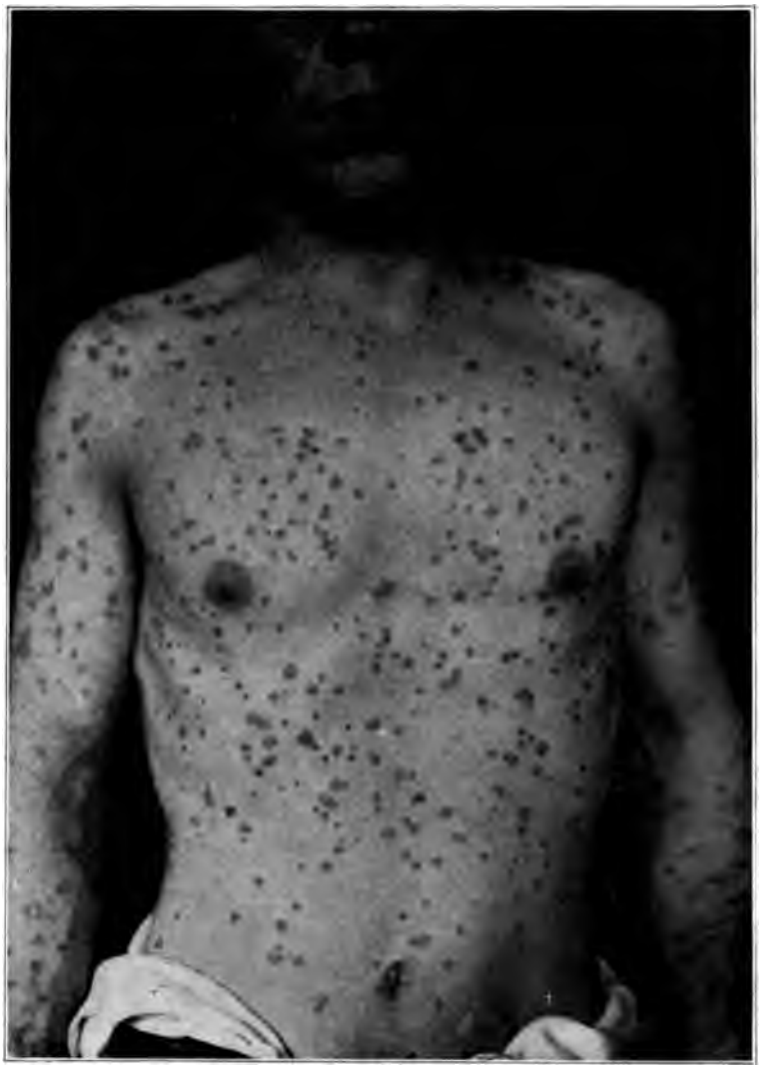

Fig. 96.—Psoriasis guttata, in a young man.

line of the body. The scales are greasy, and comparatively few in number. The axillae and other flexures are frequently involved, and there may be some tendency to moisture. Squamous eczematous le-

or the flexor surfaces, and are ill-defined, often moist, and al-
ariably itchy. There are usually a few, or many, associated
In eczema the patches are ill-defined, with more or less crust-
little scaling. In endeavoring to rule out syphilis, the symp-

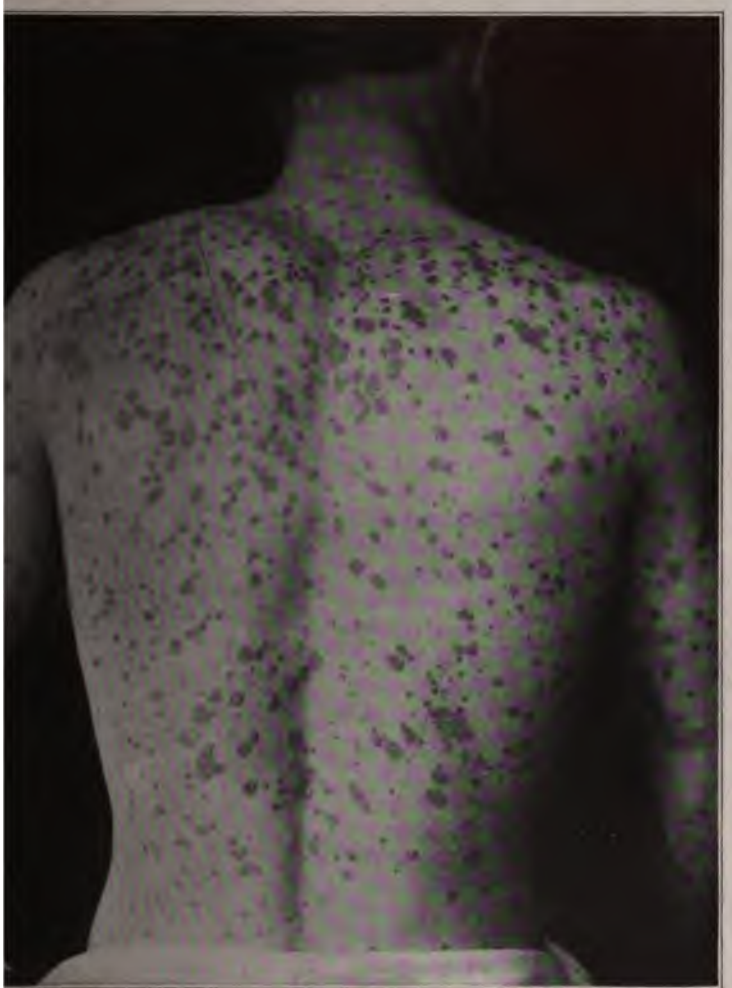

Fig. 97.—Psoriasis vulgaris, many guttate lesions.

a whole should be considered. Papulosquamous syphilo-
are small and show no tendency to enlarge. They come out
, do not exhibit a predilection for the extensor surfaces,
inctly infiltrated, and in the genital, gluteal and axillary re-

gions often become abraded and macerated. Concomitant signs of lues, such as palpable lymphnodes, bone pains, iritis, and particularly a positive serum (Wassermann) reaction, are usually present. Tertiary squamous syphilodermata are generally few in number and

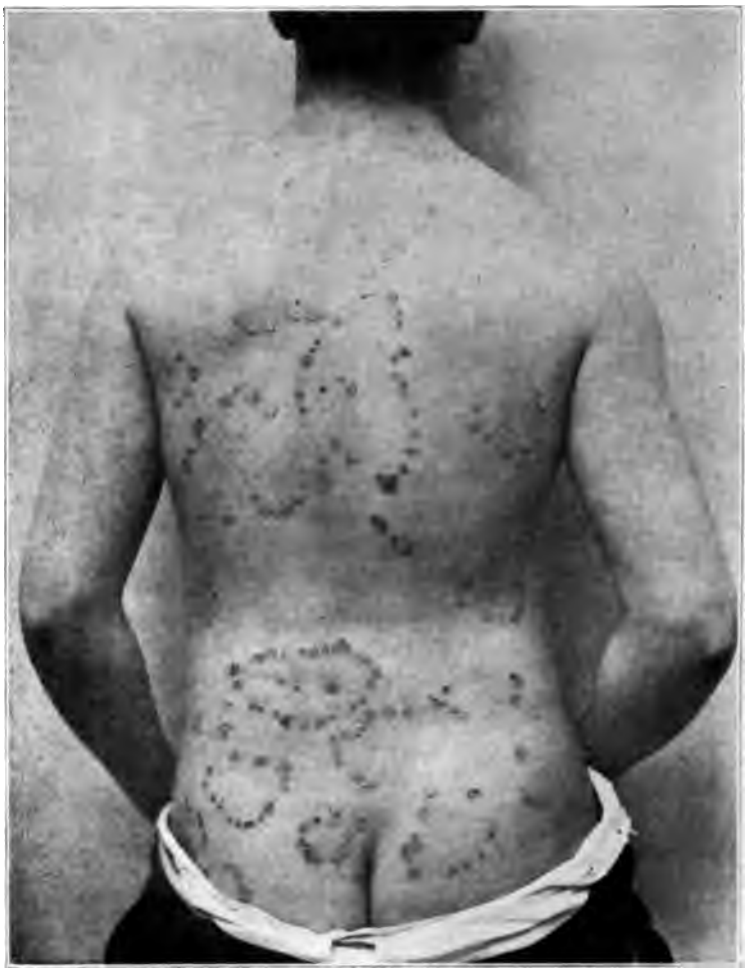

Fig. 98. Psoriasis anularis. (Courtesy of Dr. Harold C. Cole.)

asymmetrical. They are crusted, rather than scaly, frequently involve the face or the palms, are often circinate, segmental or serpiginous in outline, give rise to more or less scarring, and are commonly accompanied by a positive serum reaction. In tinea circinata the

lesions are somewhat suggestive of psoriasis of a mild type, but the absence of the characteristic, mother-of-pearl-like scales, the distribution of the lesions, and the presence of the fungus render differentiation easy.

Lichen planus attacks the flexor surfaces, gives rise to only slight scaling, is dark red or violaceous in color, and intensely itchy. In-

Fig. 99.—Psoriasis annulata et guttata. (Courtesy of Dr. Fred Wise.)

dividual papules are usually distinguishable. The characteristic "bleeding points" of psoriasis are absent. In lupus erythematosus the infiltration is marked, the scaling is slight, and there is usually more or less associated scarring. The lesions commonly occur on the face, an infrequent site for psoriasis.

Prognosis.—As a rule it is not very difficult to clear up an attack,

but freedom from recurrences can never be promised. The frequency of recurrence varies greatly with different individuals. As a rule, lesions that have existed for only a brief time are much more amenable to treatment than those of long standing. For this reason, the patient should be educated to begin treatment the moment a new lesion appears. In this way the skin can often be kept comparatively clear. In alcoholics the disease is particularly resistant, owing to the chronic congested state of the skin. Psoriatics invariably do better in a warm, moist climate, and in extremely severe cases change of residence is sometimes advisable.

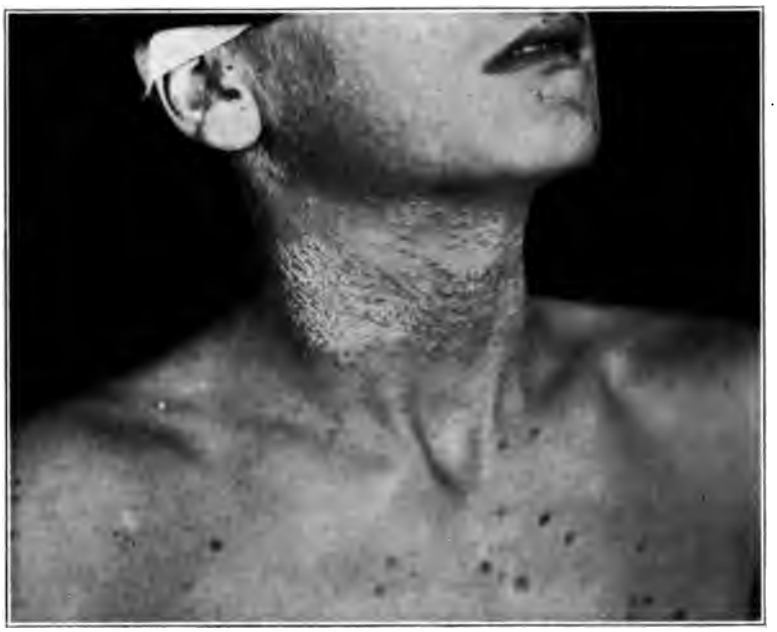

Fig. 100.—Psoriasis, showing configuration of lesions on neck following application of irritant.

Treatment.—In the treatment of psoriasis both internal and external remedies are usually essential. A few cases of the milder type respond promptly, and the eruption can be removed in from two to six weeks. Moderate cases require from one to three months, while some of the more extensive and long-standing cases are so obstinate and resistant to treatment that both patient and medical attendant almost give up in despair. Hygienic measures are important. Properly selected, nutritious, wholesome, and easily digested food, plentiful amounts of pure drinking water, freedom from care, worry and

all drains on the system, and moderate amounts of exercise in the open air, all are helpful. Alcohol, tea, coffee, and tobacco are never beneficial and usually are harmful. Constipation, if present, is to receive appropriate medication, and the general health is to be placed in the best possible condition. Of the various internal remedies recommended, arsenic, in the form of Fowler's solution, sodium arsenate, sodium cacodylate and similar preparations, stand first. The solu-

Fig. 101.—Psoriasis. The specimen is from an early papule on the arm. The elongated papillae are well represented. Moderate magnification.

tion of potassium arsenate should be given in increasing amounts, starting in with one drop, three times daily, in water, after meals. A good plan is to increase one drop per day until the limit of tolerance is reached, as evidenced by slight puffiness under the eyes, gastro-intestinal unrest, etc., then decrease the amount, day by day, until the patient is again receiving the minimum dose. I generally give the patient a card on which the appropriate dosage is marked:

First day	1-1-1
Second "	1-2-1
Third "	1-2-2
Fourth "	2-2-2
Fifth "	2-3-2
Up to, say	8-8-8
Then	8-7-8
	8-7-8
	8-7-7
	7-7-7
Down to	1-1-1

and then ascend again.

The urine should be examined for albumin at intervals of a few days, for a time at least, in order to guard against possible injury to the kidneys. The remedy should not be continued over periods of too long duration (not more than three or four months) at one time, lest arsenical keratoses and similar untoward symptoms result. Of the more powerful arsenicals, I have found both arsphenamine and neoarsphenamine valueless in the treatment of this disease. Next to arsenic the alkalies, particularly a mixture of sodium citrate and sodium acetate, with small amounts of sodium bromide, have proved valuable. Crocker recommends salicin and sodium salicylate; Pusey employs pilocarpine as an adjuvant measure in some instances; Winfield secured promising results from lactic acid, internally and by colonic irrigation; Byron Bramwell has suggested thyroid; and Morris has found wine of antimony, in 5 to 10 minim (0.33-0.65) doses, three times daily, of service. Carbolic acid, in 2 grain (0.13) doses, dissolved in glycerine and water, as recommended by Kaposi, has occasionally proved serviceable in Stelwagon's hands; and Haslund and others have advocated potassium iodide in rather heroic amounts. Of these various drugs, thyroid and the iodides may prove distinctly harmful, and are to be employed with caution. Recently the intravenous injection of autogenous serum has been suggested as a remedy in this disease, and Gottheil, Satenstein, Howard Fox, Brill, and others have reported encouraging results following its employment. Perry found injections of horse serum helpful. Recently, Engman and McGarry, and Scully have reported favorably on the influence of intravenous injections of another foreign protein, typhoid vaccine. It is administered biweekly, in doses 75,000,000 to 100,000,000. When used alone, the vaccine does not clear

up the lesions, but when used in conjunction with the ordinary chrysarobin preparations, the lesions yield much more readily than to chrysarobin alone.

Of the various external applications, preparations containing chrysarobin, salicylic acid, mineral or wood tar, ammoniated mercury, betanaphthol, and pyrogallol are the most efficient and reliable. In the milder cases, the lesions can often be made to disappear under the action of the officinal ointment of ammoniated mercury, alone or with from 2 to 5 per cent of salicylic acid added, and applied night and morning. As a preliminary measure, it is generally advisable to remove the superfluous scales by means of soft soap and warm water, rendered alkaline by the addition of sodium carbonate or borax, and applied by means of a stiff brush. In some instances the use of the ointment can be alternated with a tar lotion to good advantage.

℞ Tincturæ picis carbonis compositae (Duhring) .....3 i (4.0)*
Zinci oxidi,
Amyli pulveris,
Calaminae .....āā 3 v (20.0)
Glycerini .....3 iiss (10.0)
Aquæ .....q. s. ad f℥ vi (180.0)
Misce.

*Liquor carbonis detergens may be used instead and the quantity may be increased to 3 v (20.0).

Ointments are best applied by means of a stiff brush. An old tooth brush with the bristles closely clipped serves admirably. The medicament must be thoroughly rubbed in. Infiltrated patches of long standing are particularly resistant, and recourse must sometimes be had to oiled silk and similar impervious coverings. Of all the external applications, none is so valuable as a reliable preparation of chrysarobin. It may be applied suspended in collodion or gutta-percha solution, or dissolved in chloroform or in ointments in strengths of from 5 to 25 per cent. The drug is an exceedingly irritating one, however, and should not be employed on the scalp or face, owing to the danger of its setting up a severe conjunctivitis. The collodion and gutta-percha combinations are the most cleanly, but are not nearly so efficient as the ointment mixtures.

℞ Chrysarobini .....3 ss (2.0)*
Collodii .....ʒ i (30.0)
Misce et signa: Shake and paint on with a camel's hair brush every second or third day.

*The quantity of chrysarobin may be increased to ʒ ii (8.0) and solution of gutta percha may be substituted for the collodion.

George Henry Fox has suggested the addition of salicylic acid (from 2 to 5 per cent) to this application. When employed in the form of an ointment, tar, salicylic acid and other drugs are sometimes added. Dreuw's formula is a popular one:

℞ Chrysarobini,
Olei rusci .....āā ʒ ii (8.0)
Acidi salicylici .....ʒ i (4.0)
Saponis viridis .....ʒ vi (24.0)
Petrolati .....q. s. ad ʒ ii (60.0)
Misce.

The combination is an efficient one, but in my hands has been of no greater value than plain chrysarobin ointment. In all of the salve forms the drug is an extremely dirty and disagreeable one to use, owing to its staining properties, and in order to secure the best results the patient should give himself altogether up to treatment. The ointment is thoroughly rubbed into the patches twice daily, and the treatment is continued until all of the spots have become considerably inflamed. Ammoniated mercurial ointment or rose water ointment can then be substituted for a couple of days, when the patient is given a bath, and the entire surface inspected. As a rule the remaining traces may be eliminated by means of ammoniated mercury or tar ointment, or a collodion and chrysarobin preparation. Pyrogallol is a fairly efficient but somewhat poisonous drug, and is commonly prescribed in petrolatum or rose water ointment (3 to 10 per cent). Betanaphthol is a much safer, but considerably less active, agent, and is employed in a similar manner and about the same strengths. Tar may be employed in lotions, or in ointments, or dissolved in acetone and benzol, and is a safe and fairly efficient remedy in psoriasis. Walker strongly recommends a mixture of coal tar 1 part, benzol 2 parts, and acetone 8 parts. He has also found tar soaps, or a cleansing agent consisting of equal parts of tar, soft soap and alcohol valuable. On the scalp, resort is usually had to an ammoniated mercurial salve, supplemented by frequent green soap shampoos. Psoriasis of the

nails is as a rule exceedingly obstinate. Ammoniated mercurial ointment, alone or combined with salicylic acid, is helpful. I have found the x-rays particularly valuable in combating the disease in this locality. This agent also proves a very satisfactory one in the treatment of small areas on other parts of the body in some instances.

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PITYRIASIS ROSEA.

Synonyms.—Herpes tonsurans maculosus (Hebra); Pityriasis maculata et circinata (Bazin).

Definition.—An acute inflammatory disease characterized by numerous, yellowish, pinkish or reddish, scaly patches of various sizes and shapes which are asymmetrically distributed over the trunk and limbs.

Symptoms.—There are two clinical varieties of the disease, the macular and the circinate. The appearance of the eruption may be preceded by slight febrile disturbance, but as a rule the constitutional symptoms are slight or entirely wanting. Occasionally the submaxillary lymphnodes are palpable. A large, single primitive plaque, somewhere in the region of the waist-line, often heralds the general outbreak. The lesions vary in color from a yellowish or salmon hue to pale red, and develop as rounded, oval, or irregular macules and maculopapules, from 0.5 to 5 cm. in diameter, thinly covered with fine, imbricated, branny scales. Several, or the majority, of the patches usually increase considerably in size and the central portion tends to clear up, giving rise to slightly elevated, reddish rings with

fawn-colored centers. Coalescence of the rings may result formation of segmental or gyrate lesions of various sizes. Th tion may be limited to the trunk, but the upper arms and the frequently are attacked. Rarely, as in Howard Fox's case, the involved. Subjective symptoms are practically absent, althougl

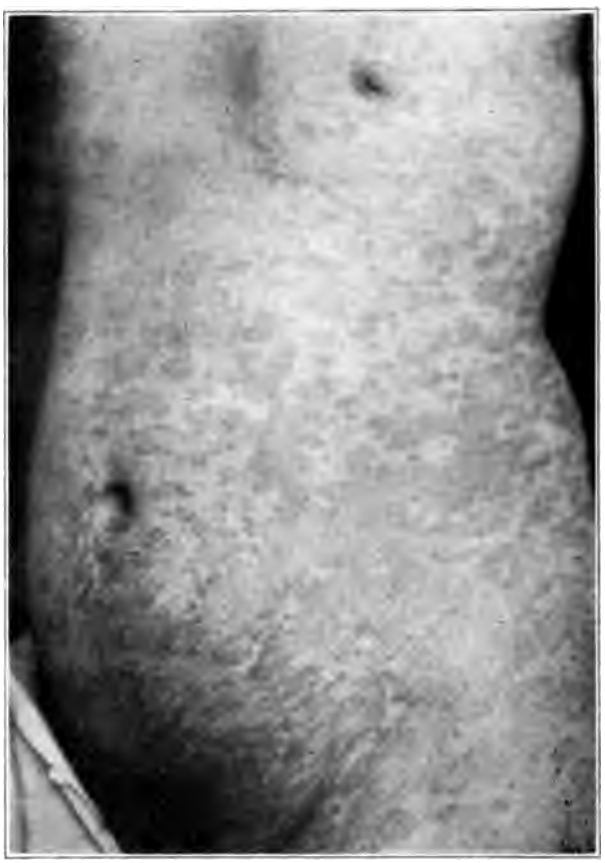

Fig. 102.—Pityriasis rosea.

itching may be present, particularly when the patient perspires. vast majority of cases an attack is self-limited, and the erupti appears spontaneously in from two to six weeks. Recurrences ai

Etiology.—The cause of pityriasis rosea is unknown. Towle it more common in women and during the fall months. If the is infectious it is very feebly so. The Vienna school has alwa

sidered the disorder a type of ringworm, despite the absence of the ringworm fungus.

Pathology.—In the early stages there is a parakeratosis, with diminished proliferative activity in the prickle layer. The vessels of the papillary plexus are dilated, and there is abundant cellular infiltration (many new connective tissue cells, and a few plasma and mast cells). There are numerous minute vesicles in the upper regions of the rete, particularly in the older lesions.

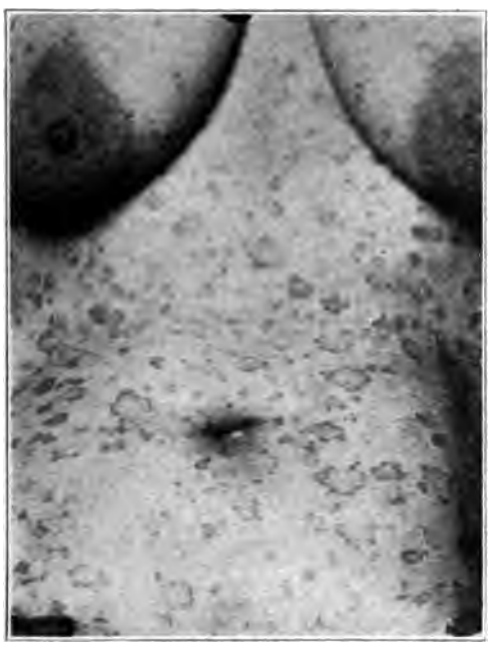

Fig. 103. Pityriasis rosea. (Courtesy of Dr. M. L. Heidingsfeld.)

Diagnosis.—The disorder is to be differentiated from seborrheic dermatitis, tinea corporis, the early squamous and circinate syphilides, and acute psoriasis. Occasionally the resemblance of the lesions to those of seborrheic dermatitis is very striking, and in some examples of pityriasis rosea occurring in seborrheal subjects time alone can clear up the diagnosis. George Henry Fox has made a very careful and exhaustive comparative study of the two diseases, and in many of his photographs it is impossible to distinguish one affection from the other. The seborrheic disorder develops more slowly, the

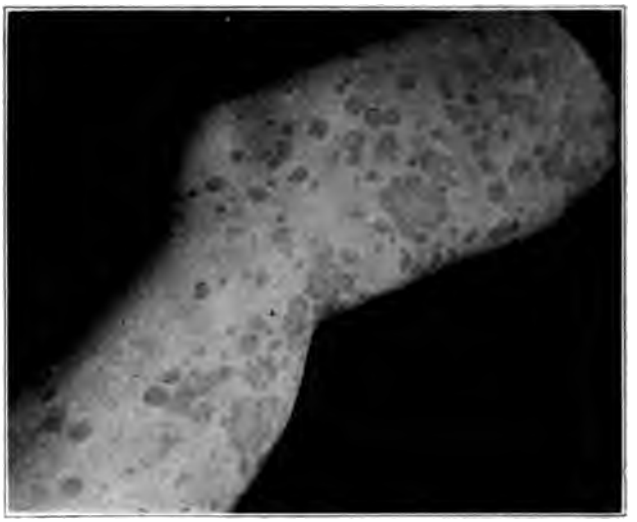

Fig. 104.—Pityriasis rosea of lower limbs, an unusual location for the lesions. (Co
Dr. L. W. Ketron.)

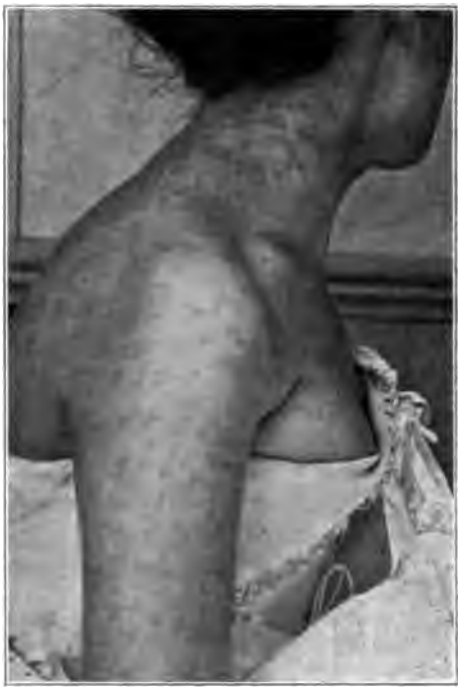

Fig. 105.—Pityriasis rosea. (Courtesy of Dr. E. Wood Ruggles.)

Fig. 106.—Pityriasis rosea. The pigmentation is due to the ingestion of arsenic. (Courtesy of Dr. L. W. Ketron.)

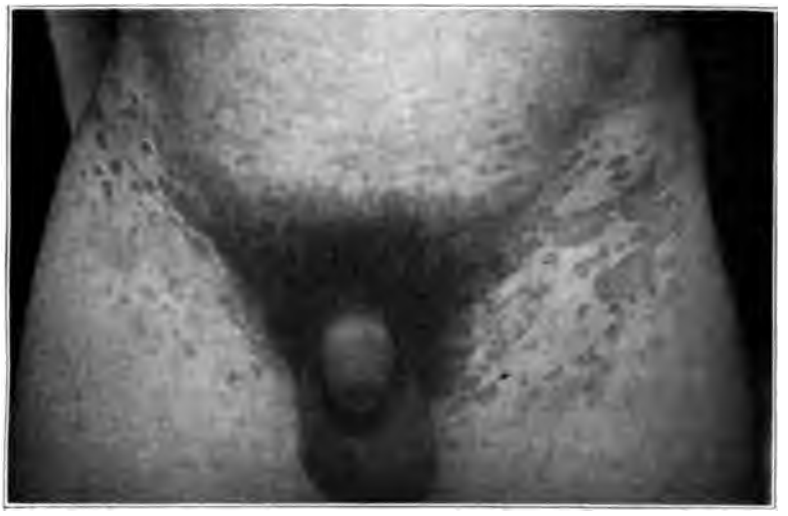

Fig. 107.—Pityriasis rosea.

scales are greasy, and the sternal and interscapular regions seldom escape.

Ringworm of the body usually begins on some exposed part, the lesions are seldom numerous, and develop quite slowly, and the fungus is always present. Papulosquamous and circinate syphilodermata are distinctly infiltrated, often give rise to staining, and frequently involve the palms. Concomitant signs of syphilis, particularly a positive serum reaction, are generally present. In psoriasis, the infiltration and scaling are more marked, the elbows and knees seldom escape, and the typical "bleeding points" are always to be found.

Prognosis.—The eruption commonly disappears spontaneously in the course of a few weeks. Crocker is of the opinion that salicin internally sometimes hastens the involution of the lesions. A mild parasiticide is possibly beneficial, and an antipruritic can be advantageously combined with it:

℞ Phenolis,
Mentholis .....ãã gr. v (0.3)
Unguenti zinci oxidi,
Unguenti hydrargyri ammoniati.....ãã 3 ii (8.0)
Adipis lanæ .....3 iv (15.0)
Liquoris calcis q. s. ad saturationem.
Misce.

This may be applied at bed-hour, and a carbolized calamine lotion, with or without liquor carbonis detergens compound (5 per cent) added, employed during the day. Dr. Louis B. Mount, of Albany, informs me that Dr. Allan Jamieson's plan, which consists of soaking the patient daily for half an hour in a bath to which 2 or 3 spoonfuls of Condy's fluid have been added, and afterward applying a 3 to 5 per cent salicylic acid ointment, is an extremely successful one, and materially shortens the course of the attack.

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DERMATITIS SEBORRHEICA.

Synonyms.—Seborrhea corporis (Duhring); Eczema seborrheicum; Seborrheal eczema; Pityriasis capitis; Seborrhea eczemaformis (Crocker).

Definition.—An acute or subacute inflammatory disease of the skin usually beginning primarily on the scalp and characterized by the occurrence of rounded, irregular or circinate lesions, covered with yellowish, greasy scales.

Symptoms.—The affection was first definitely defined and described by Unna in 1887, and is probably the most common of all diseases of the skin. Unna's conception of the disorder is somewhat broader than that of most dermatologists, and includes some papular and moist types that are generally placed in the eczema group. It is probable that dermatitis seborrheica is a specific form of inflammation of the skin, and that many of the eczematoid lesions commonly encountered in the so-called "seborrheal regions" are either eczema, pure

Fig. 108.—Seborrheic dermatitis of the sternal region.

and simple, or variable combinations of eczema and seborrheic dermatitis. The commonest form of the disease is familiar as "dandruff" of the scalp, or *pityriasis capitis*. In this location the lesions may be dry, with considerable or abundant amounts of grayish, branny scales, or they may be oozing and crusted, constituting the "eczema capitis" of older writers. From the scalp the disease may spread to the forehead and into the postauricular regions, and here again the acute, inflammatory manifestations may predominate, and more or less oozing and itching result. In the chronic types, however, the lesions on the forehead are usually scaly and infiltrated, with dark red bases, and segmental outlines. There is usually some associated itching. More or less hair loss ultimately results, and in men a localized alopecia *(alopecia frontalis)* is not uncommon. In the oilier form *(pityriasis*

steatoides), hair loss is less frequent, although the excessive greasiness necessitates the frequent use of soap and water. The eyebrows, and occasionally the lashes, are often involved, with the formation of somewhat dry, dirty, white scales. Here pruritus is a frequent accompaniment. The nasolabial folds seldom escape and, as Pusey has pointed out, in some instances the disease may be confined almost exclusively to this locality. Occasionally the vermilion border of one or both lips may become involved (see *cheilitis exfoliativa*). The chin usually escapes unless the involvement be secondary to some concomitant disease, as syphilis. Next to the scalp, the sternal region is the most frequent seat of the affection. In this region the lesions

Fig. 109.—Seborrheic dermatitis of the right axillary region.

often tend to assume circinate and segmental forms (the *seborrhea corporis* of Duhring). The scales are greasy, and unctuous to the touch. The interscapular area is another site of predilection, although the patches in this locality are seldom so characteristic as those on the chest. In the axillary and genitocrural regions the lesions may at first simulate those of ringworm, and later, as a result of heat, moisture and friction, they may take on an eczematous aspect.

Unna and Walker regard the extremely dry form of seborrheic dermatitis as identical with psoriasis, and in some instances it is almost, or absolutely impossible, to differentiate the two conditions. Pusey has called attention to the fact that the lesions of dermatitis seborrheica advance from the median line outward, whereas, psoriasis generally travels from without (the extensor surfaces of the forearms

and legs) inward. In exceptional instances, the affected skin instead of being excessively oily and covered with scales is either dry and rough (the so-called "dry seborrhea"), or thin and atrophic. These types occur oftenest on the cheeks of middle aged or elderly individuals, and it is on skins of this character that seborrheic keratoses (q.v.), or senile warts, usually develop.

Etiology.—The disease affects both sexes, and no age is exempt.

Fig. 110.—Seborrheic dermatitis of the scalp and face.

Lowered vitality, indigestion, and excessive amounts of certain foods, particularly butter and cream (Montgomery and Culver), are predisposing factors. It is extremely probable that the disorder is mildly infectious. The majority of observers are of the opinion that the affection is parasitic, but the identity of the parasite is a matter of controversy. It has been suggested that the disease may result from

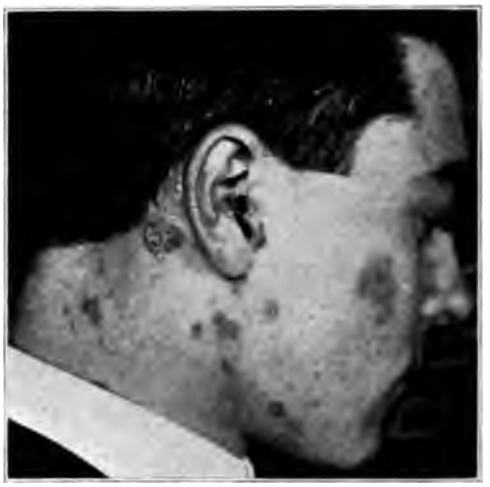

Fig. 111.—Seborrheic dermatitis.

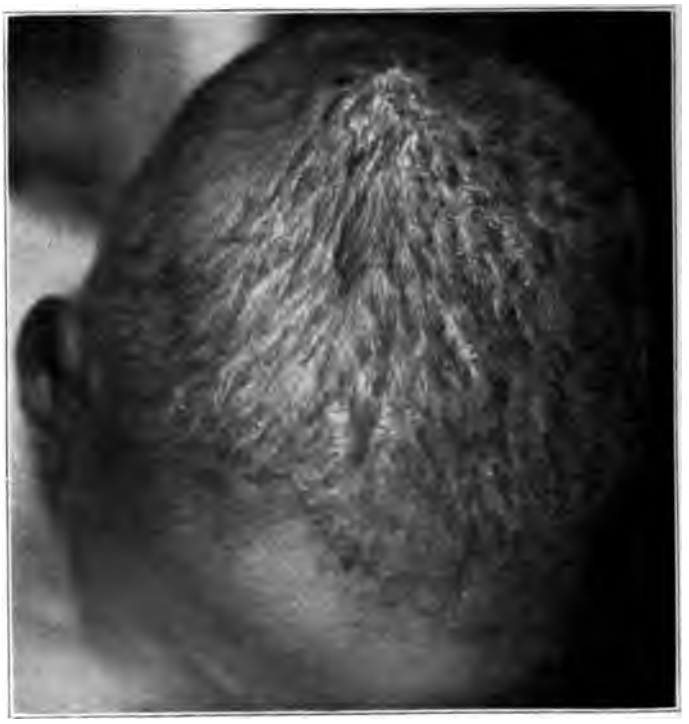

Fig. 112.—Seborrheic dermatitis of the scalp.

the combined action of two or even three micro-organisms; possibly Sabouraud's "microbacillus," Unna's "flaschen bacillus," and Unna's "morococcus." In my opinion, such a grape-shot etiologic combination is exceedingly improbable, but we must be content with it until the real exciting cause is determined.

Pathology.—Histologically the disease resembles psoriasis in many respects. There is hyperkeratosis, with slight parakeratosis, pronounced thickening of the rete, with cellular and interstitial edema, and papillary lengthening, with some intrapapillary edema and perivascular cellular infiltration, consisting mainly of small multiform connective tissue cells, in both the papillary and subpapillary

Fig. 113.—Chronic seborrheic dermatitis of the palm in a young woman.

regions. The most characteristic feature, however, is the presence of excessive amounts of fat in both the prickle layer and the coil-glands and ducts. Whether this hyperoliosis is due to a sebotaxic action on the part of the causative organism or to some other agency is not known.

Diagnosis.—The lesions of seborrheic dermatitis are to be differentiated from those of syphilis, eczema, psoriasis, seborrhea, pityriasis rosea, and ringworm. Papulosquamous syphilides may bear some resemblance to circumscribed patches of seborrheic dermatitis, but the later, tuberculosquamous, lesions are the ones most likely to cause confusion. In seborrheic dermatitis, the lesions, while segmental or circinate in outline, are superficial, and never give rise to scarring or

pigmentation. Other regions of the body also are usually involved. In syphilis the diagnosis can generally be verified by a Wassermann or luetin test. In eczema, itching, inflammation of considerable degree, and the presence of moisture at some stage of the disease are characteristic. Eczematous patches are usually infiltrated, round or oval in outline, seldom involve the sternal and interscapular regions, and are never covered with greasy, unctuous, yellowish scales. Psoriasis attacks the extensor surfaces first, the scales are bright,

Fig. 114.—Seborrheic dermatitis of neck, showing circinate lesions.

silvery, seldom greasy, and when removed the typical papillary vascular loops are exposed. In seborrhea inflammatory symptoms are entirely absent, and there is no scale formation, only excessive oiliness. Seborrheic dermatitis is to be differentiated from pityriasis rosea by the acute onset of the latter, its restriction to the trunk and upper arms and thighs, its self-limited course, and the absence of scalp involvement. In addition, the scales are smaller, drier, and free from grease. Tinea corporis generally begins on the hands or face. The lesions are circinate, with distinctly elevated edges, usually accompanied by minute vesiculation. The two disorders are most liable to be confused in those instances presenting axillary or crotch involvement. In these locations it is occasionally necessary to resort to the microscopic examination of scrapings in order to clear up the diagnosis.

Prognosis.—In the milder cases, the disease responds readily to treatment. The more severe and widespread examples, and particularly those in which the lesions are of long standing, are not so amenable, however, and even after apparent cure, relapses and recurrences are common.

Fig. 115.—Chronic seborrheic dermatitis of palm.

Treatment.—The general health should receive attention. In many instances it is advisable to restrict the diet. Pork, butter, cream, cheese, and other foods rich in fatty matter often prove detrimental. In those cases presenting inflammatory symptoms, it is well to start in with mild, soothing applications, such as carbolized calamine lotion, alternated with zinc oil. For cleansing purposes, benzine, followed by sweet oil or olive oil, should be used. Soap and water are to be avoided. An occasional (bi-weekly) painting with a 5 or 10 per cent aqueous solution of silver nitrate often proves beneficial. In the less inflammatory and chronic types, the most valuable remedies are sulphur, resorcin, and ammoniated mercury, or salicylic acid,

in varying amounts, can often be advantageously added. Of the drugs in this list, sulphur is the most reliable. Resorcin has been highly recommended by Elliot and a number of other authorities, and as a rule is extremely efficient, but I have not always found it reliable, and it also possesses the unpleasant property of staining light colored or white hair. On the scalp an excellent plan is to employ once each week an ointment containing salicylic acid and ammoniated mercury:

℞ Acidi salicylici .....gr. xv (1.0)
Hydrargyri ammoniati .....gr. xxx (2.0)
Unguenti aquæ rosæ.....f℥ i (30.0)
Misce.

This is to be rubbed in thoroughly on Saturday night, and the head scrubbed with soft, warm water, and green soap, or a good tar soap, on the following morning, care being taken to rinse all of the soap out of the hair. If the scalp is very badly involved, the salve may be used twice weekly; powdered orris root being used for cleansing purposes at one time and soap and water the next. Five or six evenings each week an application containing mercuric chloride, alcohol, and a small percentage of castor oil, is applied. Or, the same mixture, with chloral hydrate and spirit of formic acid added, may be used:

℞ Hydrargyri chloridi corrosivi.....gr. ½ (0.01)
Chlorali hydrati .....ʒ ii (8.0)
Spiritus acidi formici.....ʒ iv (15.0)
Olei ricini .....♏ vii (0.5)
Alcoholis (80%) .....q. s. ad f℥ vi (180.0)
Olei bergamottæ q. s. ut odoriferum sit.
Misce.

This prescription, which I believe was originally suggested by Johnston, is a valuable one.

C. J. White has found euresol pro capillaris, a resorcin preparation, valuable. It may be prescribed in aqueous or alcoholic solutions of 3 to 5 per cent, and may advantageously be combined with the bichloride of mercury and spirit of formic acid, as in the above-mentioned prescription.

Stelwagon speaks very highly of a scalp lotion consisting of resorcin, 1 to 5 per cent alcohol, 12 to 25 per cent and water. On the face and body recourse may be had to weak sulphur ointments, alternated with calamine lotion, or with a sulphur and talc powder:

℞ Sulphuris .....ʒ i (4.0)
Talci .....q. s. ad ℥ ii (60.0)
Misce.

This latter combination, alone or alternated with lotia alba (zinc sulphate 4 per cent, sulphur 10 per cent, sulphuretted potash, 10 per cent, in rose water) is particularly serviceable in combating seborrheic dermatitis of the face.

In the axillary and crural regions, a 10 per cent solution of silver nitrate may often be employed to advantage. The parts should be kept separated by means of powder bags or cloth bibs, and a weak resorcin lotion applied to be followed by a bland powder, several times each day. In obstinate localized types involving the glabrous skin, the x-rays often prove serviceable.

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DERMATITIS SEBORRHEICA.—*Unna*, Jour. Cutan. Dis., 1887, p. 449; Volkmann's klin. vortrag., Sept., 1893; Brit. Jour. Dermat., 1894, p. 23. — *Elliot*, New York Med. Jour., 1891, liii, p. 174. — *Pusey*, Principles and Practice of Dermatology, New York, 1911, p. 383. — *Trimble*, Jour. Cutan. Dis., 1911, p. 569. — *Trimble*, Jour. Cutan. Dis., 1917, p. 11 (the follicular type of seborrheic dermatitis). — *Lingenfelter*, Jour. A. M. A., 1918, lxxi, p. 1245.

ECZEMA.

Synonyms.—Salt rheum; Tetter.

Definition.—An acute or chronic inflammatory disease characterized by erythema, papules, vesicles, pustules, scales, scabs or crusts, alone or in combination, with associated thickening and infiltration, and more or less attendant itching and burning.

It is not possible at this time to formulate a satisfactory definition of this disorder, or to state precisely what the term includes and does not include. While few of us are willing to subscribe to Walker's radical opinion that "eczema is a term commonly applied to any wet or scaly inflammation of the skin, of the cause or nature of which the observer is ignorant," the fact remains that eczema is only a sort of dermatological scrap heap out of which, from time to time, certain diseases that present a characteristic and definite symptomatology are extracted. Scabies was probably the earliest of these rescued dermatoses, and infectious eczematoid dermatitis the latest. It is exceedingly probable that the list will be considerably augmented in the years to come.

Symptoms.—Clinically, eczema may be divided into two general types; a primary type, characterized by the presence of erythematous, papular, vesicular or pustular lesions, and a secondary, or consecutive type, in which the lesions evolve from those of the primary or elementary variety. In many instances the lesions are multiform in character from the very beginning. Probably the most frequent combination is the papulovesicular. The contents of many of the vesicles

may quickly become purulent as a result of infection with one or more of the pyogenic organisms that are constantly present on the surface of the skin, and pustulation rapidly develops. In consequence, the primary lesions may represent all four of the chief types, almost from the very onset of the disease.

Erythematous Eczema.—In the uncomplicated erythematous type the lesions consist of dry, pinkish or reddish, ill-defined patches, with more or less accompanying itching and burning. The affected skin may be slightly swollen and edematous, but this feature is seldom noticeable unless the lax tissues, such as those of the infraorbital and

Fig. 116.—Eczema of face.

scrotal regions, are involved. The patches tend to spread and to coalesce, and after they have existed for a few days show more or less branny scaling, with associated dryness and roughness of the skin. The course is usually chronic, with slight remissions and relapses. After a time the disease may merge into the squamous type, with a considerable degree of infiltration, or the surface may remain red, weeping, and slightly scaly, constituting the condition known as *eczema rubrum*. In the flexural folds, abrasions and fissuring, with more or less oozing, are not uncommon. The face is frequently attacked. In the universal types the onset is acute and may be preceded by feelings of chilliness and malaise, followed by slight fever.

The primary lesions are large, irregular, ill-defined, erythematous patches, which speedily coalesce, involving all, or nearly all of the general surface. In some respects this type resembles the acute exanthemata. There are sensations of itching and burning, and the

Fig. 117.—"Flexural eczema," eczema of the erythematous variety involving the flexures.

Fig. 118.—Chronic papular eczema of hands.

skin feels dry and tense. In these cases the disorder is as a rule, of comparatively brief duration, although recurrences are not uncommon.

Papular Eczema.—Eczema of the papular type seldom if ever, becomes generalized. The patches are more or less discrete, and con-

sist of numerous, pinpoint- to pinhead-sized, pinkish, reddish or violaceous papules, with rounded or acuminate tops. The pointed lesions are particularly prone to develop minute apical vesicles, and as a result of excoriation oozing is frequent. Many of the papules are capped with tiny blood crusts. Occasionally, the lesions may be follicular in character. The patches vary much in size and in degree of inflammation and of infiltration, and are seldom if ever symmetrical. The trunk and limbs are the most frequent sites, although no region is exempt.

Vesicular Eczema.—In the vesicular variety, which is probably the most typical form of the eruption, the disease usually appears in the

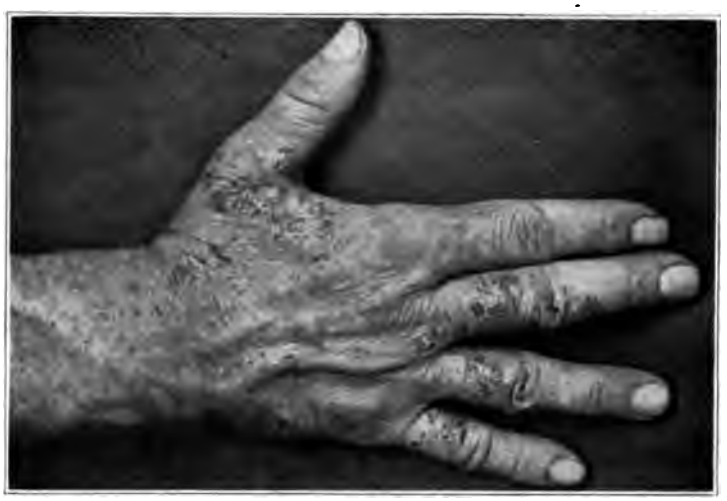

Fig. 119.—Vesicular eczema of the hand. Many of the lesions have become ruptured, leaving a raw, moist surface.

form of a few or several, discrete, erythematous patches, the surfaces of which are quickly covered with dense groups of minute, rounded or acuminate, thin-walled vesicles. In many instances these speedily coalesce, and, unless the acute inflammation subsides, the majority rupture either spontaneously, or as a result of scratching, and the patch becomes covered with thin, yellowish crusts of dried serum and inspissated pus, interspersed with raw, oozing areas of denuded epidermis. Later, when the process has assumed a more chronic aspect, the weeping becomes less marked, although it still persists, constituting one of the most typical and characteristic features of the disease. On the palmar and plantar surfaces the lesions are more deeply seated,

and look not unlike grains of boiled sago beneath the translucent epidermis. The process may be continued by the development of crops of new lesions, but as a rule the successive vesicles are fewer in

Fig. 120.—Vesiculo-squamous eczema of hand.

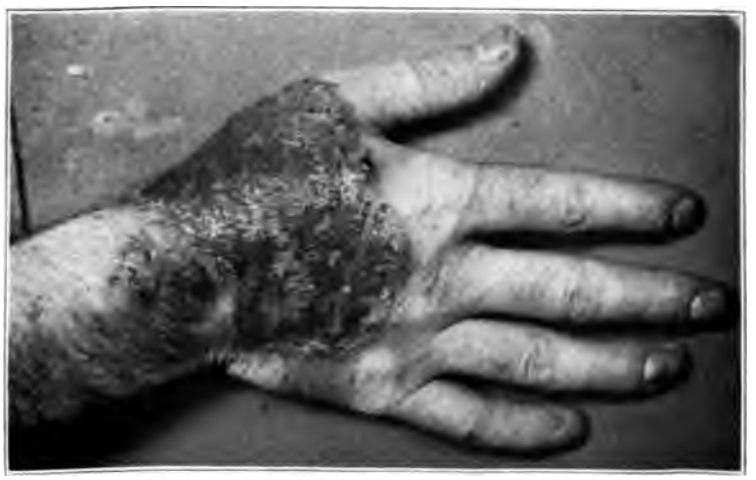

Fig. 121.—Vesicular eczema of hand.

number and less closely aggregated than those appearing at first. As a result of the irritation and chronic congestion the affected skin becomes thick and infiltrated and assumes a dark red color. The vesicu-

lar type usually terminates as a chronic eczema rubrum, although it may pass into the squamous form of the disorder. Itching and burning of varying intensity are usual, and persistent features.

Pustular Eczema.—The majority of cases of so-called "eczema pustulosum" are in reality examples of infectious eczematoid dermatitis (q.v.). Occasionally, instances of follicular eczema are encountered

Fig. 122.—Squamous eczema of face.

however in which the lesions are distinctly pustular. Unlike those of sycosis, the pustule is superficially seated, extending for only a short distance into the follicle. In addition to this type, there is an impetiginous form, occurring most frequently in individuals possessing a lowered resistance to pyogenic organisms. Both the follicular and impetiginous varieties may supervene on the vesicular form, although they usually maintain their clinical identity for a longer period than any of the other primary forms.

Of the second, or consecutive types, eczema rubrum is one of the commonest. The lesions are ill-defined, and the skin is thickened and infiltrated. The surface may be red and glazed, with only a slight amount of oozing; raw, red, and constantly covered with moisture (*eczema madidans*); or, in addition to the exudate, there may be more or less crusting (*eczema crustosum*).

Eczema fissum is not an uncommon secondary type in which the skin becomes slick, dry and inelastic, and cracks or fissures develop on slight or apparently no provocation. The tips of the fingers and

Fig. 123.—Papulo-squamous eczema of face of one year's duration.

Fig. 124.—Chronic eczema of face. Disease is of several years' standing. Note thickening of involved integument.

the heels are the sites of predilection. The disorder is an exceedingly chronic and troublesome one. Tenderness, rather than itching and burning, is the most characteristic subjective symptom.

Squamous eczema is a chronic, secondary type which is comparatively common on the palms, soles, legs and scalp. It is characterized by single or multiple, ill-defined or, occasionally, sharply circumscribed, infiltrated, thickened patches, covered with thin dry scales. The color varies from pink to dark red. Itching is frequently, but not invariably present.

Eczema sclerosum is another type presenting marked evidences of thickening. In this variety there is an elephantiasis-like papillary

hypertrophy which results in the formation of rough, horny, verrucose patches. The sites of predilection are the legs, soles and palms. Fissuring is frequent.

Furrowed eczema, the "eczema craquelé" of the French, is a rare type in which the skin is slightly erythematous, harsh and dry, and the outer layers of the epidermis become the seat of innumerable, tiny, linear cracks, which cross each other at various angles, thus dividing the surface into squares and diamond-shaped spaces not unlike those occurring on a sun-dried mud bank.

Under the name of "A Recurrent Eczematoid Affection of the Hands," Pollitzer has recently studied and described a rebellious and troublesome type of vesicular dermatitis which affects the dorsal surfaces of the hands. The patches are round or oval in outline, and vary from 2 to 10 cm. in diameter. They consist of groups of vesicles or vesicopapules, and in some respects resemble the lesions of "eczema nummulare."

As commonly employed, the term "parasitic eczema" is a misnomer (see *ringworm*).

Etiology.—The essential cause of eczema is unknown. The disease occurs in both sexes and at all ages. No class is exempt. Statistically, it constitutes from 30 to 35 per cent of all cases of skin diseases. Heredity is not a direct factor, although a predisposition to the affection can probably be inherited. Individuals possessing thin, dry skins are particularly susceptible, and persons suffering from xeroderma and similar disorders are especially liable to attacks. The disease is not infectious. The recognized factors which may enter into its causation are so numerous and diverse that for purposes of discussion they may conveniently be separated into two groups: the external or exciting, and the constitutional or predisposing.

External Causes of Eczema.

In susceptible individuals long continued or even transitory irritation from any source, chemical, mechanical, actinic or thermal, may give rise to a dermatitis which may be followed by eczema. Knowles separates the external causes into three classes: parasitic, irritation resulting from causes exclusive of occupation, and irritation occurring as a result of occupation (trade eczema).

The majority of investigators hold that eczema is not due to the action of any single, specific organism, although certain bacteria, particularly staphylococci and streptococci frequently play an important secondary part in the evolution of the lesions.

The possible external causes under the second and third classes are almost innumerable. The chemical irritants include a large number of substances employed in the professions and trades, from simple washing powders and dilute acids to complicated dyes and dye stuffs. Probably the most common of all is the excessive use of soap and water, particularly highly alkaline soap and hard or "alkali" water. Many apparently innocent substances are provocative of the disease under certain conditions. Exposure to salt, cold brine, etc., may give rise to "butcher's eczema;" antiseptics (particularly formalin and mercuric chloride) to "surgeon's eczema" or "nurses' eczema;" paste mixtures to "paper hanger's eczema;" metol and similar developing agents to "photographer's eczema;" and so on, almost ad infinitum. Irritating secretions, such as diabetic urine and decomposed sweat, are not infrequent causes, and the disease may follow the application to the skin of various remedies, such as turpentine, mustard, and croton oil. The first attack generally tends to render an individual more susceptible, and so long as he continues to come in contact with the offending irritant he is seldom if ever free from the disorder. Of the various mechanical irritants, chafing from clothing or from ill-fitting trusses, and scratching, for the relief of various pruritic conditions, are probably the most common. The effect of thermal irritation is often seen in stokers and coal passers aboard ship, and blacksmiths ashore. Exposure to extreme cold, especially cold winds, is a not infrequent cause, as Corlett and Cole have shown. The actinic rays of both natural and artificial light often give rise to an erythema or an erythematous eczema ("eczema solare"). The disease undoubtedly deserves consideration as an indicator of deficient elimination in many instances. Dietetic indiscretions and faulty selection of food are often powerful supplemental factors, especially in infantile eczema.

The relation of disturbances of the nervous system to outbreaks of eczema has been carefully studied by Bulkley and by Dyer, who hold that nerve strain and reflex irritation are often important factors in the etiology of the disease. There is a certain localized type of eczema, characterized by sudden outbreaks, involving the flexures of the elbows, the anterior axillary folds, and the inner extremities of the shoulders, which I believe belongs to the "neurotic" group. The majority of the patients are women, between their thirty-fifth and fiftieth years, and it is possible that the onset or presence of the menopause has something to do with the occurrence of the disease. Another, and not

less important group of cases, also occurring in middle-aged women, is the peculiar neurotic type of eczema of the occipital region which is not infrequently preceded by a lichen chronicus simplex. The so-called "tooth rash" in infants may be of reflex origin in some instances, but usually it develops as a result of dietetic errors or anaphylaxis (C. J. White). Anaphylaxis following focal infections, particularly of the teeth (apical granulomas) and tonsils, is a common cause of erythematous eczema in adults. During the past three years, I have observed and learned to recognize a peculiar type of dermatitis in farm laborers, due to a reaction to the pollen of "rag-weed." It is an anaphylactic phenomenon, and promptly develops in sensitized individuals

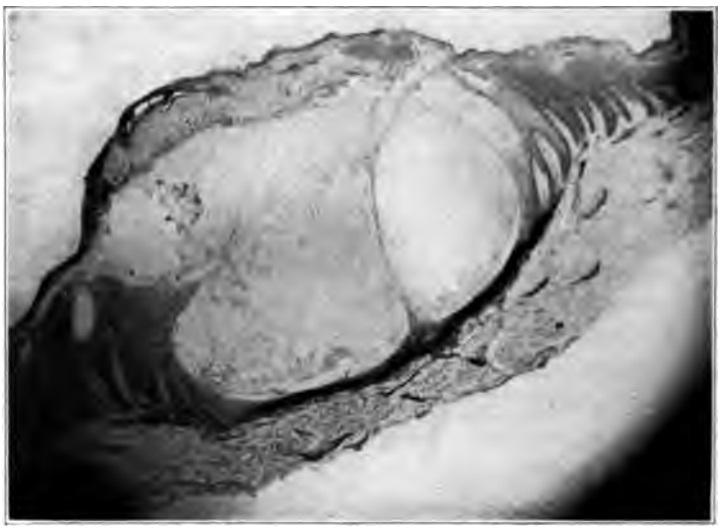

Fig. 125.—Vesicular lesion in acute eczema. Low magnification.

every time, winter or summer, that they come in contact with the offending pollen.

Pathology.—The histologic changes simulate those occurring in dermatitis seborrheica, but in eczema the excessive amounts of fat are absent. In the acute variety the papillae are swollen and edematous, the intrapapillary vessels are dilated, and there is present more or less perivascular cellular infiltration. There is a decided acanthosis, and the prickle cells are swollen and disabled. The majority fail to undergo the usual metamorphosis, and vesiculation and abnormal keratinization result. The vesicles contain not only serum but loose prickle cells as well, and Robinson believes that it is largely to the body substance of these elements that the gummy character

of the vesicular contents is due. The granular layer is altered and may be altogether lost. The moist, raw surface of the rete affords an ideal culture field for bacteria, and staphylococcic and streptococcic involvement is the rule rather than the exception.

In *eczema rubrum* the parakeratosis and acanthosis are even more marked, and the lowermost layers of the rete may exhibit decided changes. There is more or less cell migration into the prickle layer in both this variety and in the acute type. In the squamous forms the inflammatory changes in the epidermis are as a rule less marked, although the stratum corneum is greatly thickened, and there is more or less accompanying desquamation. There is a slight degree of acanthosis, but the basal layer of the epidermis is but little altered. In long-standing cases the papillae are enormously enlarged, however, and the cellular infiltration may extend down to the cutaneous cushion of fat. Slight changes in the connective tissue may occur, and these, together with the dense perivascular exudates, tend to render the disease exceedingly chronic, and very resistant to treatment.

Diagnosis.—In typical examples of the four primary types of eczema the diagnosis is as a rule not difficult. It is the borderline cases that give rise to confusion. The disease must be differentiated from the following conditions:

Erythema.—In simple erythema the symptoms are those of active congestion only, and inflammation, scaling and itching are absent. Erythema intertrigo may at times resemble eczema, but the reddened areas are not infiltrated, itching is usually absent, and the exudate lacks the color and stickiness seen in eczema. The lesions of erythema multiforme are symmetrical, sharply defined, seldom scaly, never moist, and itchiness is the exception and not the rule.

Scabies.—Scabies frequently closely resembles eczema, and in long-standing cases often merges into it. In scabies the lesions are discrete, the sites of predilection being the dorsal surfaces of the interphalangeal webs, the anterior axillary folds, the flexor surfaces of the wrists, and the penis in adult males, and the wrists, the flexor surfaces of the hands and feet, and the buttocks in infants. The lesions are linear in character, and a careful search for burrows should be made. The family history often is suggestive. Cleanly and well-to-do individuals seldom contract the disease, but the acarus is no respecter of persons, and nobody is immune.

Ringworm.—Ringworm begins and spreads in a manner wholly

different from that of eczema. On the scalp, the patchy hair loss, the presence of stumps, the age of the patient, and the almost total absence of itching, all are suggestive, and in doubtful cases an examination of some of the hairs in the affected area will clear up the diagnosis. On the glabrous skin the characteristic circinate lesions, with slightly scaly centers and vesicular, advancing margins, generally suffice for identification. In the axillary and genitocrural regions differentiation may be more difficult, but the sharply defined outlines of the ringworm lesions, the frequent concomitant presence of satellite patches, and the history generally serve to identify the disease. In doubtful cases, resort can be had to a microscopic examination of scrapings from the margin of the affected area.

The lesions in tinea barbae are circumscribed, nodular and inflamed. The affected hairs can be easily and painlessly extracted, and contain fungi.

Pityriasis Rosea.—The acute onset and the general distribution of the lesions in pityriasis rosea, together with their non-infiltrated and only slightly inflammatory character, the practical absence of itching, and the self-limited nature of the disease, should render differentiation easy.

Sycosis.—In sycosis the inflammation is follicular, and when the hair is extracted the whole root sheath will be found to be inflamed and swollen. Many of the lesions are pustular, but all are dry, whereas in eczema vesiculation occurs in and between the follicular openings, the affected area is often moist and sticky, and the disease is seldom confined entirely to the bearded region.

Erysipelas.—Erythematous eczema is frequently mistaken for erysipelas, but the two disorders have few symptoms in common. In erysipelas constitutional symptoms are always present. The disease begins at some special point and gradually extends, the affected patch being infiltrated and swollen, with sharply defined borders, and a smooth and glossy looking surface, with occasional bullae. There is rarely, if ever, any itching. In eczema rubrum the skin is red, tense and infiltrated, with more or less oozing, but no accompanying fever.

Lichen Planus.—In lichen planus the papules may be mistaken for those of papular eczema, and the coalesced lesions for patches of eczema squamosum. The individual lichen planus papules are to be recognized by their shape, color, and exceedingly chronic course. They never ooze or become crusted, and excepting for their tendency to coalesce, usually retain their identity throughout their course, and

leave bluish or brownish, pigmented spots when they regress. The coalesced and hypertrophic lichen lesions are dry, rough, brownish or purplish, and scaly, with sharply defined borders, and outlying satellite papular lesions are often present.

Syphilis.—The secondary eruptions of syphilis are symmetrical, and more or less universal. They develop suddenly, and there is frequently a history or some remaining clinical evidence of chancre. Concomitant symptoms of the disease such as palpable lymphnodes, ulceration of the throat, and a positive serum reaction usually are present. In the late syphilides, pigmentation and atrophic scarring are usual accompaniments, and itching is seldom present.

Herpes Zoster.—The onset, distribution, course, and character of the lesions in herpes zoster, together with the shooting, neuralgic pains which frequently accompany the disease, are sufficiently characteristic to prevent confusion.

Psoriasis.—The lesions of psoriasis are always dry, scaly, and sharply defined. They exhibit a preference for the extensor surfaces. They itch but little, if at all, and the typical "bleeding points" can always be demonstrated. On the palms, soles and scalp, differentiation is less easy, but psoriasis is very rarely, if ever, limited to these regions.

Impetigo Contagiosa.—Impetigo contagiosa may resemble pustular eczema. In impetigo the lesions are usually discrete and begin as small, thin-walled vesicles which quickly break and form yellowish crusts. The affected area is hyperemic, but not infiltrated, and there is no associated itching. Impetigo contagiosa of the scalp is often associated with pediculosis capitis, and this fact, together with the usual location of the lesions in the occipital region, should be borne in mind.

Miliaria.—In miliaria the lesions are discrete, and their course is self-limited. There is an almost total absence of itching, and there is usually a history of profuse sweating.

Urticaria.—Papular urticaria is sometimes confused with papular eczema. In the former the lesions are never grouped, however, and the distribution is more or less general. Typical urticaria wheals are almost invariably present at some time during the course of the attack. The lesions may be capped by blood-crusts, but are always dry. In pruritus, itching is the only symptom. Seborrhea is characterized solely by an excessive flow of sebum. The diagnosis of seborrheic dermatitis, prurigo, pemphigus and pemphigus foliaceus is given under those various diseases.

Prognosis.—In the majority of instances eczema tends to run a chronic rather than an acute course. It is always amenable to treatment, however, and temporary relief can as a rule be safely promised. The disease is prone to relapses and recurrences, however, and immunity from future attacks cannot be assured unless the underlying etiologic factors have been discovered and eliminated.

Treatment.—*Internal Treatment.*—The patient's general health should receive attention. The vast majority of individuals eat too much, drink insufficient amounts of water, and exercise too little. The diet should be simple, consisting of nutritious, easily digested foods. Pork, sausage, cheese, rich gravies, highly spiced foods, salted and canned meats, pastries, tomatoes, and hot breads are to be avoided. Sugar in excessive amounts is harmful. As C. J. White and others have demonstrated, one of the simplest methods of eliminating causative dietetic factors is by means of cutaneous reactions, and by faecal examinations. Two of my friends, Dr. Milton Hahn, of Arkansas City, and Dr. V. Pleth, of Sonora, California, have called my attention to observations of Finklestein and Ludwig Meyer on the value of salt-free diet in eczema. In a small percentage of cases the removal of sodium chloride from the dietary has an almost marvelous effect on the cutaneous lesions, causing them to totally disappear in the course of forty-eight hours or even less. Alcohol is very liable to aggravate the trouble, and coffee and tea should be taken in moderation, if at all. The same holds true of tobacco. Rest, and freedom from care and worry should, if possible, always be secured. Inasmuch as derangements of the gastrointestinal tract are probably the most frequent of all the supplemental causes, the condition of the bowels should always be investigated. The daily drinking of copious amounts of water is as a rule an excellent measure. Massage of the abdomen, and graduated exercise often are of service in overcoming constipation. Of the various drugs that have been recommended, I have found a compound cascara and bile salt pill a very satisfactory preparation. The ordinary fluid extract of cascara sagrada is an efficient, although somewhat bitter, remedy. The Hinkle's formula cascara pill is convenient, reliable, tasteless and inexpensive. An occasional mercurial purge (preferably three Compound Cathartic Pills, U. S. P., taken at bed hour, once fortnightly) is beneficial in many instances. Saline cathartics often prove valuable, particularly in obese and full-blooded patients, but in feeble and anemic individuals discretion should be exercised in their use. In cases where the urine is extremely acid and of high

specific gravity alkaline diuretics occasionally prove helpful. Of the various sedatives, sodium bromide, in moderate amounts, is the most valuable. In these cases Angle recommends a pill which I have found quite satisfactory:

℞ Asafœtidæ,
Extracti valerianae,
Extracti sumbul .....āā gr. i (0.06)
Extracti cannabis indicae.....gr. ¼ (0.015)
Extracti hyoscyami .....gr. ⅓ (0.02)

Misce, fiant tales pilulae No. 1. Signa: One pill three or four times daily.

Opium and its derivatives bind up the secretions, and render the itching worse. They should never be used in eczema. We possess no specific constitutional remedies for the treatment of this malady. In gouty and rheumatic individuals colchicum, sodium salicylate, and the salines are indicated, and often one or all of these drugs is employed empirically on "general principles." Salicylic acid and the salicylates are liable to upset the digestive tract, and often do more harm than good. The same is true of arsenic. Pusey has found pilocarpine valuable. In dry skinned and xerodermatous subjects it sometimes ameliorates the itching, and may help to bring about a cure. The same authority strongly recommends the x-rays in acute and chronic eczemas of vasomotor origin. Light exposures are given, at daily intervals, or on alternate days. I have found this agent a helpful one. Crocker advocates counterirritation, secured by the use of a mustard leaf over the various spinal areas. Careful search should be made for focal infection of the teeth, tonsils, sinuses, and the prostate and appendages. These frequently give rise to anaphylactic phenomena. In eczema of the so-called "anaphylactic type," an effort should be made to desensitize the patient by the injection of repeated graduated doses of some foreign protein, as typhoid or colon vaccine.

In infants and young children the proper regulation of the diet is very essential. The little patients should receive plentiful amounts of drinking water, with fresh fruit juices, and a balanced ration. In many instances it will be found that too much fat and sugar are being taken, a fact which can readily be ascertained by food tests and faecal examinations. In patients of the debilitated, anemic type, tonics, with cod-liver oil, cream and similar rich foods are indicated. Small amounts of milk of magnesia or sodium bicarbonate often are beneficial. For combating the constipation which is so frequently present, phenolphthalein, cascara sagrada, enemata, or glycerine sup-

positories may be used. Stelwagon highly recommends a mixture of castor and cod-liver oils, in spiced syrup of rhubarb.

External Treatment.—The local treatment is extremely important, for upon it is largely dependent the ultimate result secured. In the vast majority of instances the use of water, and particularly soapy water, is detrimental. Scales and crusts can readily be removed by the use of almond or olive oil, cold cream or petrolatum. After the adherent masses have been softened, the cleansing process can be completed with the aid of a bit of cotton, moistened with benzine. Afterward a thin coating of grease is reapplied. No hard and fast rules can be laid down for the selection of local applications. Oftentimes the remedy must vary with the individual, even though the stage and character of the disease are apparently identical. As a general plan it is always best to commence with a soothing remedy, such as calamine lotion, carron oil, zinc oxide ointment, or zinc oil, and gradually change over to the more powerful, stimulating remedies later, should it be found necessary to do so. In eczema this is particularly important, for, no matter how long the disease has been present, acute or subacute manifestations are either present or are fairly liable to put in appearance at any time, and until the character of the offending lesions is thoroughly appreciated the adoption of radical therapeutic measures may be followed by an exacerbation of the disease, and the loss of the patient's confidence. Stelwagon's dermatologic axiom that so long as a selected remedy or plan is benefiting, it should be continued, is a wise one.

The choice of applications is also, in a measure, due to the location of the lesions. In acute cases of the disease the principal object, following the removal of the source of irritation, is to subdue the inflammation and relieve the subjective symptoms. In the chronic cases, in addition to these factors we must bring a congested and infiltrated derma back to a normal condition, and for this purpose recourse is had to one or more of the so-called "reducing agents." In the early, acutely inflamed, moist examples, lotions are to be preferred to salves, and an aqueous solution of aluminum acetate (1 to 3 per cent) often serves admirably. Lead and opium lotion, in one-half or full strength, dabbed on, or applied in the form of a moist dressing, also is valuable. At the end of forty-eight or seventy-two hours, the surface of the skin becomes pale, cool and wrinkled, and calamine lotion (containing from 0.5 to 1. per cent of carbolic acid) may often be substituted to advantage, at least during the day. At night, carbolized zinc oxide ointment, or carbolized zinc oil, may

be applied. J. C. White has recommended the use of lotio nigra, either full strength, or diluted with an equal amount of lime water, to be followed by zinc ointment. The lotion is dabbed on freely for fifteen minutes, and allowed to evaporate, then the ointment is applied, either directly to the skin or spread on cloths. MacClennan, Carbaugh, and others have found a saturated aqueous solution of picric acid valuable in some instances, and particularly so in small moist patches. The remedy is applied once or twice daily for a week or more, or until the surface of the lesion becomes dry and crusted. Zinc ointment or a similar application is then substituted for a few days, later to be replaced by the acid solution, if necessary. Stelwagon speaks highly of boric acid solution in the treatment of this type of the disease. It is employed in a 3 percent. aqueous solution, to which carbolic acid (0.5 to 1 per cent) and glycerine (4 to 8 per cent) have been added. For the relief of the itching, carbolic acid (.5 to 1 per cent) is the most valuable and reliable agent we possess. Menthol, in similar strengths, substitutes a sense of coolness for that of the itching and burning, and is quite serviceable at times, particularly when employed in oily mixtures. Tar, in the form of liquor carbonis detergens or tincturae mineralis compositus (Duhring), may be employed as an antipruritic, in strengths of from 1 to 2 per cent. In the dry types of eczema salves, alone, or alternated with lotions, give the best results. Lassar's paste, with the salicylic acid (1 to 2 per cent) as originally recommended, omitted, is a valuable preparation:

℞	Zinci oxidi,		
	Amyli pulveris .....āā	ʒ ii	(8.0)
	Petrolati .....q. s. ad	℥ i	(30.0)
	Misce.		

C. J. White speaks highly of 5 per cent crude coal tar in Lassar's paste.

The skin should be kept free from dirt, grease, and scales: and for this purpose, I know of nothing so good as Pusey's liniment.

℞	Powdered tragacanth	ʒ i	(4.0)
	Phenol		
	Glycerine .....āā	gtt. x	(0.6)
	Olive oil	℥ iv	(120.0)
	Aquae .....q. s.	O i	(480.0)
	Ol. bergamot to perfume.		

For antipruritic purposes carbolic acid or menthol can be included, and a small amount (5 per cent) of boric acid can sometimes be advantageously added (Duhring).

If infiltration is slight or absent, the use of a mild, antipruritic

powder is occasionally advisable. The one suggested by Anderson have found extremely valuable:

℞ Camphoræ pulveris .....3 i (4.0)
Zinci oxidi .....3 v (20.0)
Amyli pulveris .....q. s. ad ʒ ii (60.0)
Misce.

This is dusted on freely several times daily.

In applying soothing salves, care should be taken to use a sufficient amount to keep the surface covered between renewals. The dressings should be changed at least three or four times during the twenty-four hours. In the universal types of eczema, oily mixtures are as a rule more soothing and comforting than lotions or powders. The well-known "calamine liniment" often serves admirably:

℞ Phenolis .....ʒ ss (2.0)
Zinci oxidi,
Amyli pulveris,
Calaminæ .....āā ʒ ii (60.0)
Olei olivæ .....ʒ viii (240.0)*
Liquoris calcis .....q. s. ad fʒ xvi (480.0)
Misce.

*May use expressed oil of almonds instead.

Unna's plaster-mulls are cleanly and elegant, but they have the disadvantages of being expensive, and difficult to procure. In the more advanced and subacute cases, exhibiting some infiltration, applications of a more stimulating character are indicated, although, as previously stated, progress in this direction must be attended with caution. An aqueous solution of silver nitrate (5 to 10 per cent) may be applied to the affected area, at intervals of from two to five days. Soothing applications, such as calamine lotion and zinc oil, should be employed conjointly. Of the various reducing agents, tar has proved the most efficient and reliable in my hands. In the subacute and chronic, dry types it may be applied in an ointment, but if there is much moisture present, lotions are to be preferred. Either vegetable or mineral tar can be used. A very satisfactory ointment consists of:

℞ Liquoris carbonis detergentis.....ʒ ii (8.0)
Adipis lanæ .....ʒ i (30.0)
Unguenti zinci oxidi.....q. s. ad ʒ ii (60.0)
Misce.

Or,

℞ Picis liquidæ .....♏ xv (1.0)*
Unguenti zinci oxidi.....q. s. ad ʒ i (30.0)
Misce.

*Quantity may be increased to ʒ ss (4.0).

Or,

℞ Olei cadini .....3 ss (2.0)*
Unguenti zinci oxidi.....q. s. ad ℥ i (30.0)
Misce.

*Quantity may be increased to 3 i (4.0).

In the circumscribed patches, and particularly those exhibiting marked evidences of thickening, recourse may be had to much stronger applications. Salicylic acid, in ointment, or in plaster form (10 to 25 per cent), is probably the best of all keratolytics, and can be employed conjointly, if necessary, with soap plaster or green soap shampoos. Bulkley has suggested the application of an aqueous solution of potassium permanganate (2 to 10 per cent) in these cases, and I have found the remedy valuable, both as an antipruritic and a curative measure. The same author's "liquor picis alkalinus" (caustic potash 1 part, pix liquida 2 parts, and water 5 parts), in lotions (5 to 20 per cent) and in ointments (10 to 20 per cent) also proves serviceable at times. An aqueous solution of caustic potash (15 to 25 per cent), carefully applied by means of a swab, and followed, after drying, by zinc oxide or diachylon ointment, gives quick results, but must be employed with circumspection.

Treatment of Regional Eczema.

Eczema of the Scalp.—In this locality the disease is generally erythematous, pustular or squamous. The first two types respond to treatment fairly well, the squamous form is often rebellious and obstinate. In the erythematous variety, a carbolized aqueous solution of boric acid (5 per cent) may be employed twice daily, with carbolized rose water ointment, added at night. In many instances, frequent applications of almond oil, containing 1 to 2 per cent of carbolic acid, will suffice to bring about a cure. The scalp should be washed infrequently, or not at all, so long as the disease persists. In the pustular type, which in both adults and children is frequently complicated with pediculosis, the lesions should be soaked overnight with olive or almond oil, applied on strips of cloth and held in place by a bandage or cap. The areas may then be cleansed with the aid of benzine, and a carbolized ammoniated mercury (5 per cent) or yellow oxide mercury (10 per cent) and rose water ointment mixture applied, to be renewed twice daily. For the marginal lesions, and particularly those in the postauricular regions, calamine lotion and the yellow oxide ointment generally suffice. A preliminary painting

with 5 or 10 per cent aqueous solution of silver nitrate is often helpful in combating the disease in these localities. In the infiltrated, squamous types, stimulating applications are required, and a salicylic acid (2 to 5 per cent) ammoniated mercury (10 per cent), and lard or rose water ointment, combination often act well. Sulphur

Fig. 126.—Chronic papular eczema of hand.

Fig. 127.—Squamous eczema of hand.

(2 to 5 per cent) may be added, if desired. Tar, in the form of oil of cade or liquor carbonis detergens, occasionally proves valuable, and is also an excellent antipruritic. In eczema of the nuchal region, C. J. White strongly recommends an ointment consisting of crude coal tar (1 part) and zinc oxide (1 part), in vaseline (16 parts). Resorcin (1 to 5 per cent), in lotions or in salves, also is serviceable at times, but

it frequently stains the hair, and I have found it therapeutically unreliable.

Eczema of the Ears.—Eczema of the ears often gives rise to considerable edema. Astringent lotions, such as aqueous solution of aluminum acetate (1 to 3 per cent), or lead and opium wash, may be employed at first, and calamine lotion, alternated with zinc ointment, later. If there is much oozing, an occasional painting with an aqueous solution of silver nitrate (2 to 5 per cent) is beneficial. Another excellent, but unsightly, application is a saturated aqueous solution of pyoktanin blue.

Eczema of the Face in Adults.—Eczema of the forehead may be due to irritation from the hat band, and in the perioral region, the

Fig. 128—Chronic eczema of the hand, of five months' duration. The lesions are suggestive of a trade dermatitis, but the hand was not exposed to the action of irritants.

disease may occur as a result of the use of an irritating tooth powder. The most common type of facial eczema is the erythematous, although, and particularly in elderly persons, there may be a supervening eczema rubrum. The so-called "spectacle type," which is practically limited to the palpebral regions, is comparatively common. In this locality, calamine lotion, or lotio nigra (50 per cent) as suggested by White, alternated with zinc oxide ointment or zinc oil, answer admirably. In eczema rubrum, an occasional painting with an aqueous solution of silver nitrate (5 to 10 per cent) hastens recovery, and in both varieties short exposures to the x-rays often act satisfactorily. For cleansing purposes, cold cream should be used, and water and soap are to be avoided.

In the bearded region eczema of the papular, vesicular and mixed types is not infrequent. As a rule the affected areas are not confined entirely to the hairy surface, but lap over on the glabrous skin. In the earlier stages, lotions containing aluminum acetate (2 to 5 per cent) and water may be advantageously employed during the day, and zinc oil, or a mild tar ointment, at night. The x-rays often prove helpful in these cases also.

Eczema of the Breasts.—Eczema of the nipples is not uncommon in nursing mothers, and sometimes proves quite resistant to treatment. In the earlier stages, applications of calamine liniment, which leaves a thin, oily coating on the surface, may be used. The parts should be cleansed once daily with cold cream or almond oil. Any

Fig. 129.- Squamous eczema of the palm, in a young woman.

existing fissures may be painted with compound tincture of benzoin, or with a mild aqueous or ethereal solution of silver nitrate (2 to 5 per cent). The nipples should be carefully dried, by tapping with a soft towel, after each nursing, and a soothing, antiseptic ointment, such as boric acid (2 per cent), or ammoniated mercury (1 to 3 per cent) in equal parts of cold cream and lanolin, applied.

Eczema of the Hands.—The hands are probably the most frequent of all sites for eczematous lesions. On the dorsal surfaces of the hands and fingers it commonly occurs in the form of small groups of papules or papulovesicles, seated on reddened, inflamed bases. All possible sources of irritation should first be removed. Water, and particularly soapy water, is especially harmful. For cleansing purposes, recourse should be had to cold cream and similar substances.

In addition to calamine lotion, carbolized zinc oil, and weak tar ointment, solutions of silver nitrate (2 to 10 per cent), saturated aqueous solutions of pyoktanin blue, and the x-rays often prove valuable in

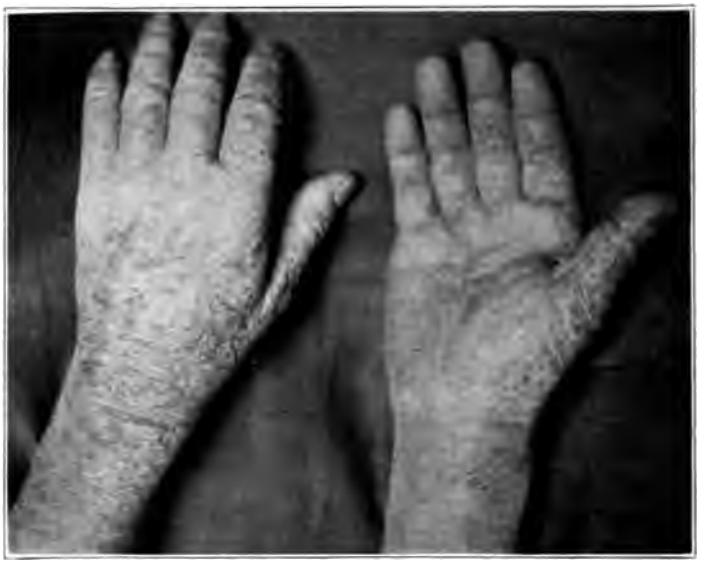

Fig. 130.—Squamous eczema of the hands.

Fig. 131.—Eczema of nails.

combating the disease in this region. In the palmar types there is commonly more or less thickening and infiltration, and strong

keratolytic and reducing agents are required. Green soap shampoos, followed by the application of ointments containing salicylic acid (10 to 25 per cent) and oil of cade (2 to 10 per cent) or ammoniated mercury (10 to 20 per cent) frequently prove useful. Surgeons, nurses, and dressers whose hands are frequently exposed to the action of strong antiseptic solutions often can avoid disagreeable consequences by the frequent use of a mild, protective ointment. Ordinary tallow serves fairly well, or lanolin, diachylon ointment, or rose water ointment may be used. If the skin is harsh and dry, tragacanth cream, or a mixture consisting of rose water, 1 part, camphor water, 1 part, and glycerine, 4 parts, may be applied once or twice daily.

Eczema of the Nails.—In eczema of the nails, the matrix and the

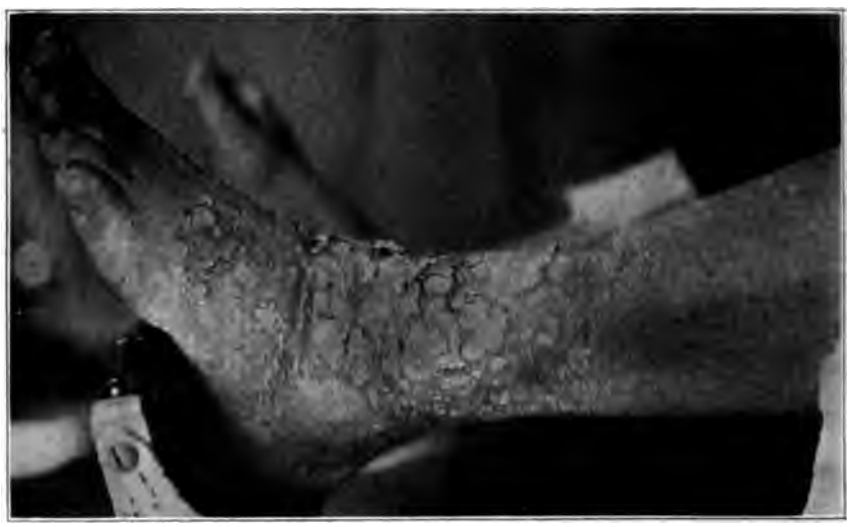

Fig. 132.—Squamous eczema of legs.

periungual regions are the parts commonly attacked. The condition is an obstinate and rebellious one. Ointments containing salicylic acid (2 to 5 per cent) and ammoniated mercury (5 to 10 per cent) are valuable. The hyperkeratosis commonly present beneath the free margin of the nail responds fairly well to strong salicylic acid ointments, or the excessive horny material can be softened by means of an aqueous solution of sodium hydrate (25 per cent), and removed with the aid of a small curette.

Eczema of the Feet.—Eczema of the toes, particularly eczema involving the sides of the toes, is often associated with hyperidrosis of these parts, and frequently it is difficult or impossible to cure

the eczema until the hyperidrosis is under control. For this reason the x-rays constitute a valuable remedy in combating the disease in this locality. Daily, or tri-weekly, applications of an aqueous solution of silver nitrate (2 to 10 per cent) are helpful, and a saturated aqueous solution of pyoktanin blue often does good. Ruggle's mixture, which consists of salicylic acid (2 per cent) and tannic acid (10 per cent), in alcohol, I have found valuable, particularly in the chronic, infiltrated, and fissured cases. The toes should be kept separated by means of pledgets of cotton, and the liberal use of Ander-

Fig. 133.—Eczema of leg. (Courtesy of Dr. Otto Leslie Castle.)

son's antipruritic powder is both comforting and beneficial. The patient should be instructed to wear soft leather shoes, having broad, foot-form toes. Eczema of the dorsal and plantar surfaces is treated in the same manner as that suggested for eczema of the hands.

Eczema of the Legs.—In elderly persons, and in individuals suffering from varicose veins and similar circulatory disturbances which may give rise to venous stasis, eczema of the legs is a common and distressing ailment. All types and stages of the disease are to be found in this region, although in long-standing cases, eczema rubrum is the most common variety occurring on the legs, and the thickened

verrucose type on the ankles. The choice of local applications is largely dependent upon the symptomatology. If marked inflammation and edema are present, the parts should be kept slightly elevated, and at rest. After the oozing is under control, elastic cotton bandages (no rubber) may be applied, and are both comforting and curative. In applying the dressing, the limb should be elevated, and

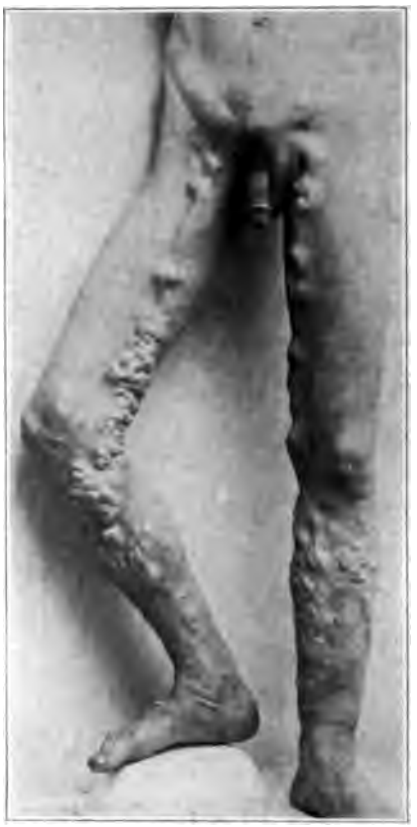

Fig. 134. Varicose eczema of mild degree in a very susceptible subject. (Courtesy of Dr. John W. Perkins.)

the diseased area covered with a dusting powder. The free end of the bandage is then passed around the instep, and carried upward in spiral turns, each turn overlapping the one preceding it by about one-half the width of the bandage. If necessary, the affected surface may first be covered with salve-mulls or similar dressings, and the bandage applied over these. Under any circumstances the dressings should be changed at least once, and better two or three times,

during the twenty-four hours. The soft or hard, soluble, gelatine fixed dressings, suggested by Pick, Unna and others, are particularly valuable in the treatment of these cases. The soft jelly con-

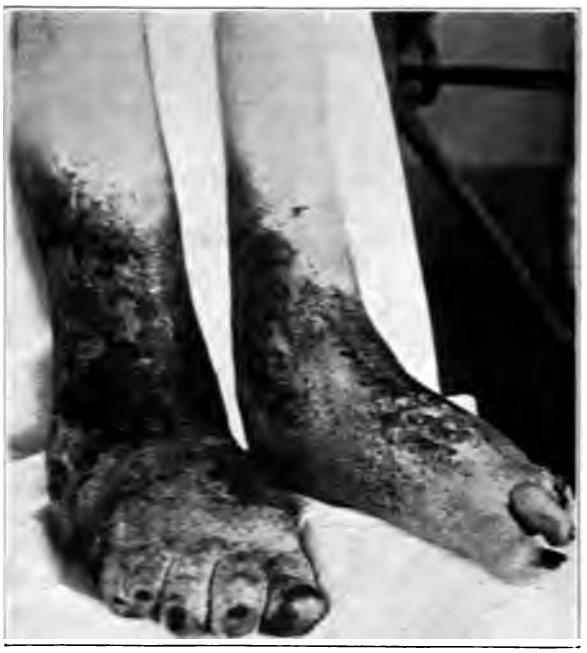

Fig. 135. Chronic eczema, with associated arthritis deformans. (Courtesy of Dr. Otto Leslie Castle.)

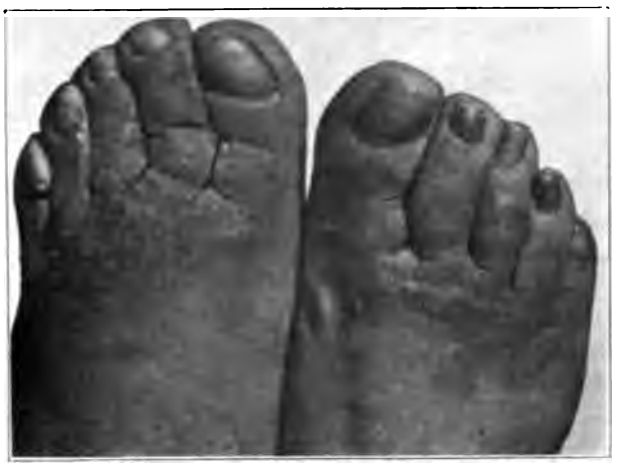

Fig. 136.—Hyperkeratotic eczema. (Courtesy of Dr. E. Wood Ruggles.)

sists of zinc oxide, 15 parts, gelatine, 15 parts, glycerine, 25 parts, and water 25 parts; and the hard jelly consists of zinc oxide, 10 parts, gelatine, 30 parts, glycerine, 30 parts, and water, 30 parts. Carbolic acid (0.5 to 1 per cent), ichthyol (1 to 5 per cent) or tar (1 to 5 per cent) can frequently be advantageously added. The mixture is heated on a water bath, and when it becomes fluid is applied to the affected areas by means of a brush. A good plan is to paint on a thin coat, then apply a layer of gauze or cotton, to be followed by one or more coats of the gelatine mixture.

Eczema of the Genitals and Anus.—In these regions the disease

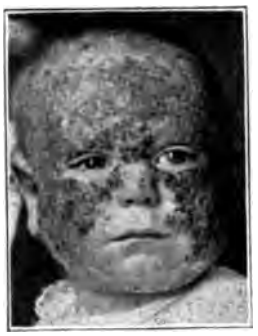

Fig. 137.—Infantile eczema. (Courtesy of Dr. E. Wood Ruggles.)

Fig. 138.—Infantile eczema of the usual type.

often proves obstinate and rebellious to treatment. The urine should be carefully examined for sugar, and in women inquiry should be made regarding the possible use of irritating cleansing solutions. In scrotal eczema, a "scrotal apron" should be worn to prevent the moist, inflamed parts from becoming abraded by friction against the thighs. In cases involving the anus, search should be made for fissures and hemorrhoids. The patient should be instructed to keep the parts clean by occasional applications of water and castile soap. Soft, uncolored toilet paper should be used. In the acute cases, astringent and soothing lotions are to be employed. In the thickened and infiltrated cases, tar may be added to these, or a weak salicylic acid (3 to 5 per cent) and oil of cade (5 per cent) ointment tried. Solutions of silver nitrate and of pyoktanin blue often prove

valuable. The brief application to the affected parts of cloths wrung out in hot water is strongly recommended by Pusey. A soothing ointment, spread on cloth, is applied immediately afterward. The effect is both soothing and curative. A lotion of carbolic acid (0.5 to 1 per cent), thymol (.2 per cent), dilute hydrocyanic acid (1 to 3 per cent), glycerine (3 to 5 per cent), and water is useful for alleviating the itching, or carbolic acid (0.5 to 1 per cent), menthol (0.5 to 1 per cent) or cycloform (10 to 25 per cent), in rose water ointment, may be employed for this purpose. Bronson's oil I have found valuable in overcoming this symptom in chronic, infiltrated lesions. The x-rays also constitute a reliable therapeutic measure in combating these cases and are of very great service at times.

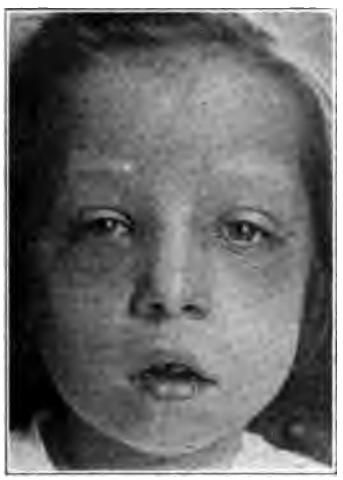

Fig. 139.—Recurrent erythematous eczema of face, probably due to anaphylaxis.

Infantile Eczema.—Infantile eczema is usually acute or subacute in character, and any or all of the four types of the disease may be represented. The flush areas of the cheeks are the sites of predilection, although the forehead, ears, and even more distant parts of the body are not infrequently involved. In patients of this age the disorder is a chronic and persistent one, rebellious to treatment, and prone to relapses and recurrences. In the vast majority of instances the disease tends to disappear spontaneously as the child grows older. Pusey, Hutinel and Rivet have reported instances in which a fatal septicemia developed as a result of bacterial involvement, but the development of so serious a condition is fortunately exceedingly rare. It is probable that gastrointestinal derangements, with

resulting intoxication from the alimentary tract, have much to do with the causation of the malady in these cases. The maintenance of a proper nutritional balance is essential, and if this is successfully accomplished recovery is generally prompt and complete, even though no local measures are employed. C. J. White has recently

Fig. 140.—Infantile eczema.

pointed out that excessive amounts of sugars or fats are responsible for many cases of infantile eczema, while anaphylaxis (usually from egg-white) accounts for a considerable percentage of the remaining instances. In a more recent contribution, White advises cutaneous tests in all cases of infantile eczema, with subsequent regulation of diet. He has found ointments containing small amounts of crude coal tar valuable, particularly in the moist cases.

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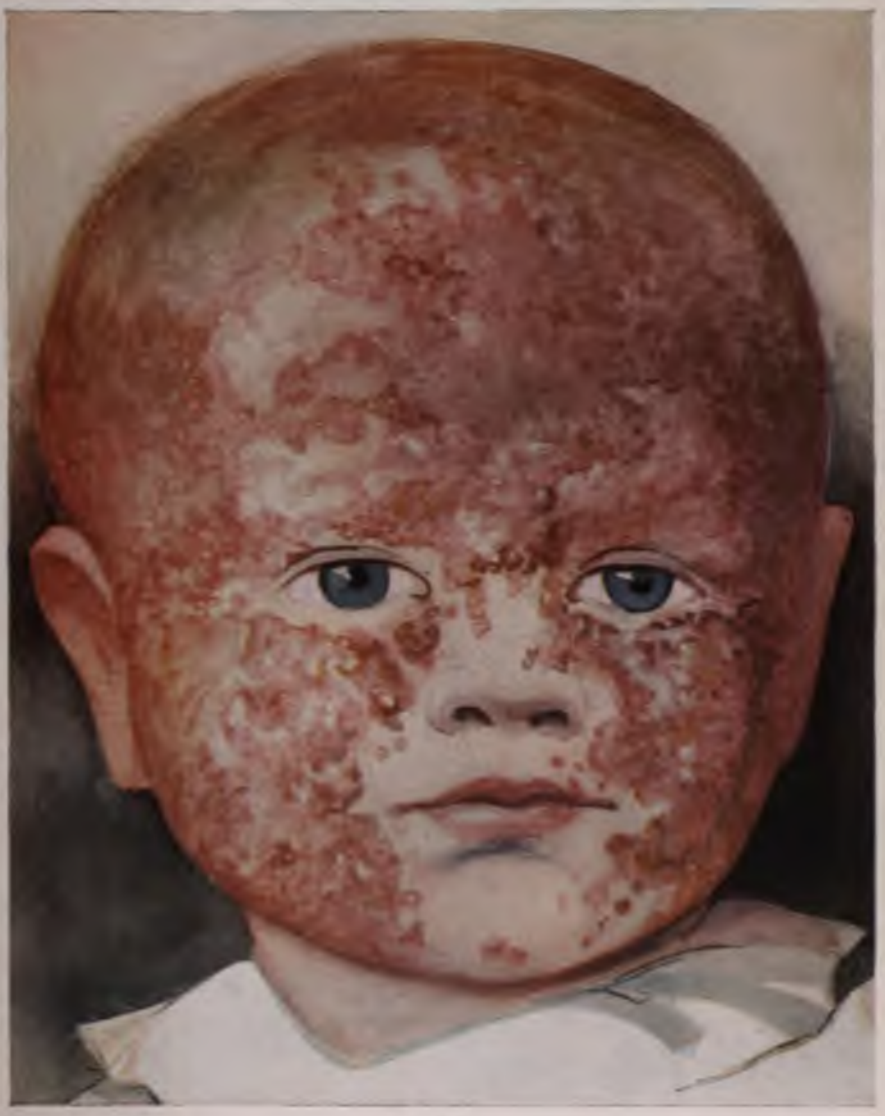

PLATE I.

Infantile Eczema.

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DERMATITIS INFECTIOSA ECZEMATOIDES.

Synonyms.—Pustular eczema (many cases); Impetiginous eczema (some cases). Engman's disease.

Definition.—Infectious eczematoid dermatitis is an inflammatory disease of the skin, characterized by the occurrence of erythematous, vesicular, pustular, or scaly, circumscribed patches, which commonly develop as a result of trauma or infection.

Symptoms.—The disease was first described in 1902 by Engman, who pointed out that it differed essentially from eczema in the more limited acceptation of the term. The exposed parts are those most frequently affected. A history of trauma, infection, or association with suppurative conditions is characteristic of the malady. The initial or earliest lesion may be a vesicle, pustule, or erythematous, scaly or crusted point or plaque. The vesicles are not so closely placed and are larger than those seen in an acute vesicular eczema. As a rule the lesions are asymmetrical. The eruption occurs in circumscribed patches of moderate size, which increase by peripheral extension. When the disease begins as vesicles they soon break to form a scaly patch which extends in the usual manner. New foci

may begin as a cluster of vesicles. The epidermis at the periphery of the lesion is usually sharply undermined, split up, detached or raised; the two latter conditions being due to perceptible or imperceptible collections of serous or seropurulent fluid which may, if they contain much fibrin, instantly form a thin, ridge-like crust about the periphery. New lesions occur as a result of autoinoculation. There is no attempt at central involution. Itching is slight, or entirely absent. There is usually associated lymphnode involvement. Fordyce has frequently encountered the affection in individuals of lowered vitality who had previously suffered from scabies or pediculosis. In my experience, the disease has often been associated with

Fig. 141.--Infectious eczematoid dermatitis.

furunculosis, and such slight suppurative disorders as an infected, ingrowing toe nail. The disease is commonest in active adults. Engman emphasizes the points of resemblance existing between this malady and the so-called "tubercular eczema"—a pustular dermatosis seen "chiefly on the face or in association with conjunctivitis and rhinitis, or otorrhea in the strumous children of the poor." It is probable that many cases of "I. C. T." (inflammatory connective tissue) are examples of this disorder.

Etiology.—Engman recovered the yellow or white staphylococcus in pure culture from both the early lesions and the surface and crusts of the later patches. Experimental autoinoculation could usually be successfully performed, although the lesion thus produced

id not begin as a vesicle, but as an erythematous patch which soon came moist and crusted. Fordyce likewise believes the disease to

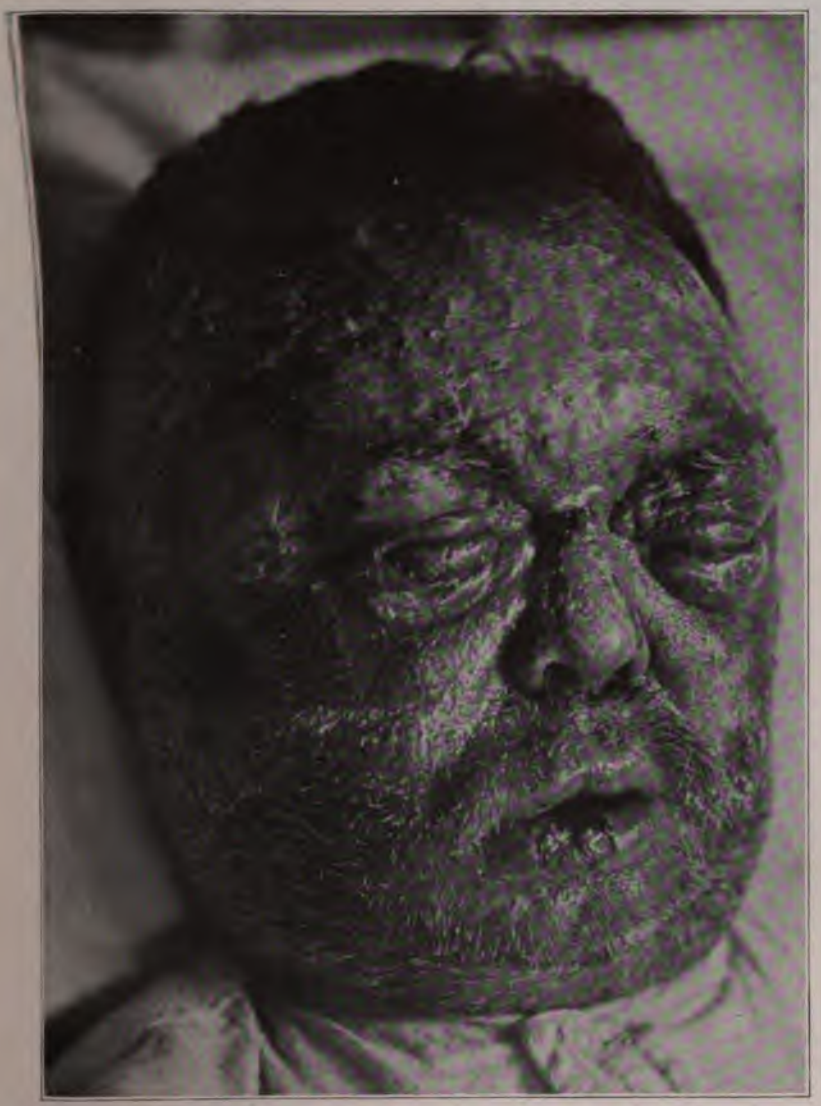

Fig. 142.—Infectious eczematoid dermatitis of the face and scalp. The initial lesion, a furuncle, developed on the chin. Staphylococcus pyogenes aureus recovered in pure culture.

be due to the action of the staphylococcus aureus, but considers it probable that anaphylaxis also plays some part in the causation. In

the majority of the cases that have come under my care the staphylococcus has been found in pure culture.

Pathology.—The papillae are swollen and congested. Ther slight acanthosis, with some accompanying edema of the cells. The destructive process is most marked in the lowermc ers of the stratum corneum. The horny layer is undermin detached, and the elevated margins are frayed and broker

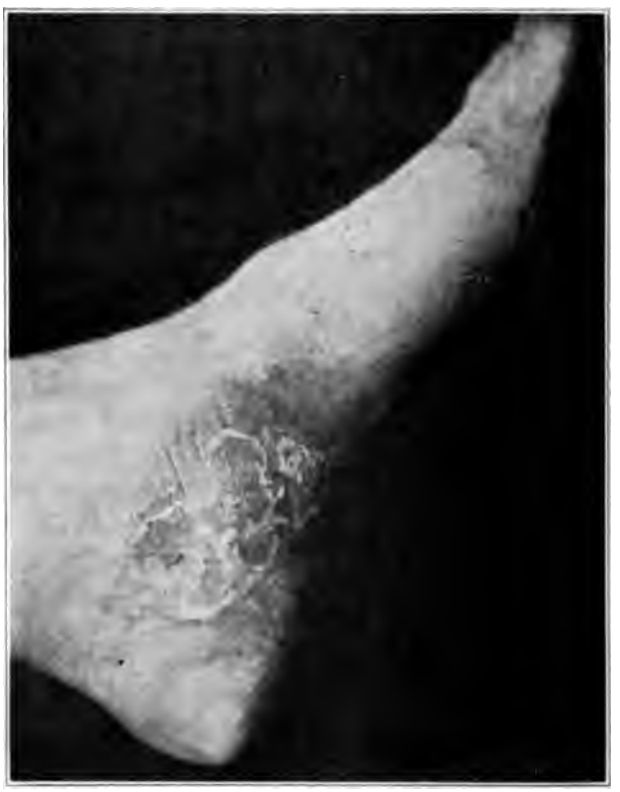

Fig. 143. Infectious eczematoid dermatitis.

casionally minute abscesses are to be found in the upper regions rete. In Gram-Weigert sections numerous groups of cocci seen in and about these cavities.

Diagnosis.—The malady is to be differentiated from p eczema, impetigo contagiosa, ecthyma, and dermatitis repe pustular eczema the lesions are pinpoint to pinhead in si closely grouped, with a tendency to spontaneous rupture

affected areas are ill-defined, and erythematous and papular lesions generally accompany the pustules. New patches are not formed by autoinoculation, and there is seldom a history of preceding trauma, infection, or association with suppurative conditions. Impetigo contagiosa occurs oftenest in children. The lesions are as a rule, single and discrete, and the disease seldom involves the body and limbs. Crusted impetiginous areas most closely resemble those of infectious

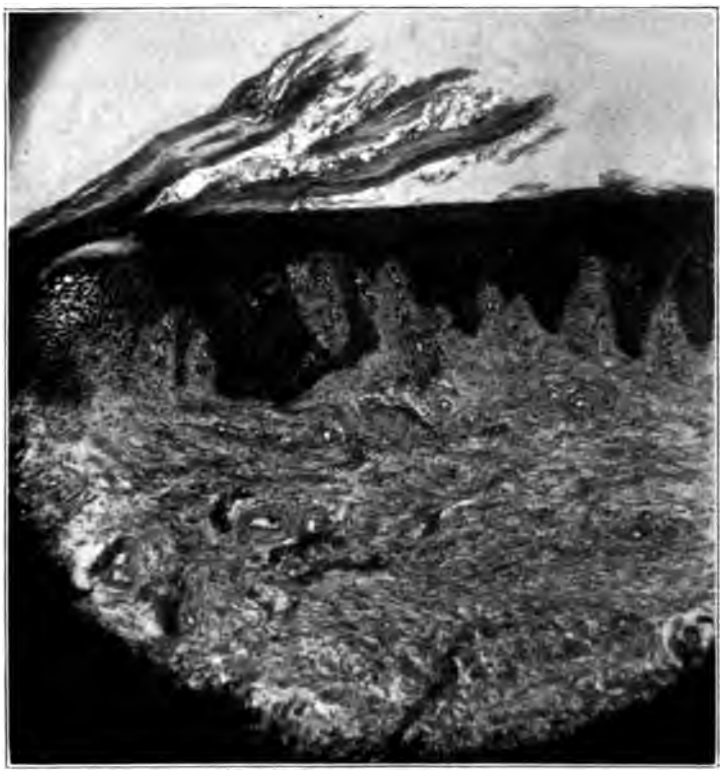

Fig. 144.—Section from a lesion of infectious eczematoid dermatitis, showing superficial character of inflammation. Low magnification.

eczematoid dermatitis, but the history, the thick, yellowish crusts, and the concomitant presence of one or more of the characteristic discrete lesions of impetigo will serve to identify it. The discrete, pea- to finger nail-sized, deeply seated pustules and crusts of ecthyma are distinctive. Infectious eczematoid dermatitis never gives rise to scarring. Dermatitis repens usually involves single areas, and central involution is the rule rather than the exception. The abscesses are more deeply

seated, and while it is possible to produce new lesions by autoinoculation, the spread of the disease in this manner is unusual.

Prognosis.—In the majority of instances the disease responds favorably to treatment. Occasionally it proves obstinate and rebellious. Recurrences are not infrequent.

Treatment.—Ointments containing ammoniated mercury (2 to 5 per cent) are probably the most efficient. A saturated aqueous solution of pyoktanin blue is of value at times. I have found autogenous vaccines in large doses, commencing with injections of 500,000,000 of the dead staphylococci twice weekly, and gradually increasing the amount up to 1,000,000,000, of very great service at times, particularly in persistently relapsing cases.

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HERPES SIMPLEX.

Synonym.—Fever blisters.

Definition.—An acute inflammatory affection characterized by the occurrence of groups of vesicles on erythematous, swollen, edematous bases.

Symptoms.—The eruption generally involves only the facial or genital regions. The early manifestations are those of itching and tension, followed by localized hyperemia. The patches are usually few in number, and the vesicles, which vary in size from a pinpoint to a large pinhead, are filled with clear fluid, and develop on the swollen, reddened areas in the course of a few hours. As a rule there is some slight preceding constitutional disturbance, but this may be so trivial in degree as to be overlooked by the patient. The walls of the lesions are rather thick and tough, and there is no tendency to spontaneous rupture. Suppuration may occur. If unmolested, the vesicles dry up and form thin, yellowish or brownish crusts which drop off in the course of ten days or a fortnight. As a rule there is no scarring. In herpes facialis, the lips, the perioral regions, and the cheeks are the parts most frequently involved, although the external ear, particularly the auricle, is occasionally attacked. The inner surfaces of the lips are sometimes affected, and recurrent attacks of this type may prove quite disagreeable to the patient, and very often are obstinate and resistant to treatment. Herpes genitalis is not uncommon. In this locality, and particularly on the glans, abrasion is not infrequent, and when the patient appears for

treatment only a group of raw, circumscribed areas (the bases of the former lesions) are to be seen. In women, the affection involves not only the labia, but also the adjacent areas. In men the penile shaft as well as the prepuce or glans may be the seat of the eruption.

Fig. 145.—Herpes simplex.

Etiology.—The cause of herpes is unknown, but it is extremely probable that the affection is of bacterial origin. Indigestion, exposure to sunlight and to other forms of irritation, and certain febrile and toxic

Fig. 146.—Herpes simplex of penis.

states are often important supplemental factors. In some instances reflex irritation possibly plays a part.

Pathology.—The papillae are swollen and edematous, with dilated

blood and lymph vessels. The vesicles are deeply seated, in many instances being entirely subepithelial. The bordering prickle cells are increased in size, although their contour is well preserved, and they may exhibit degenerative changes, particularly fibrinous coagulation. A few leucocytic nuclei are to be found in the intercpithelial lymph spaces. The overlying cell elements are acidophilic (Unna).

Diagnosis.—Herpes facialis is to be differentiated from vesicular eczema and impetigo contagiosa. In vesicular eczema the lesions are small and closely arranged, rupture readily, exude gummy serum, and itch more or less intensely. Herpetic vesicles are of self-limited duration, those of eczema are persistent. In impetigo contagiosa the vesicles are discrete, autoinoculable, develop serially, and do not involve the lips.

Herpes genitalis may be confused with chancroid, and rarely with chancre. In chancroid there is always more or less ulceration, and the lesions, while often multiple, are never grouped as in herpes. The inguinal lymphnodes are palpable and tender. The Ducrey-Unna bacillus is usually present. The incubation period of chancre is relatively long, whereas herpes frequently develops within a few hours following intercourse. As a rule the chancre is more or less infiltrated, and lymphnode involvement is almost invariable. In doubtful instances, search should be made for the spirocheta pallida.

Prognosis.—An attack of herpes seldom extends over a period of more than a week. Recurrences are not infrequent, however, particularly in herpes genitalis. The opinion formerly quite generally accepted, that herpetic lesions are of prognostic import in various systemic diseases has now been generally abandoned.

Treatment.—All possible sources of reflex or local irritation should be removed. In the earlier stages of the affection, lotions serve best. Spirits of camphor, alcohol, alone, or with zinc sulphate (0.2 per cent) added, or cologne water with alum (2 per cent) may be prescribed. In those cases involving the commissures of the mouth, an occasional painting with silver nitrate (10 per cent or even with the pointed stick) has proved more efficient in my hands than benzoin, collodion and similar agents. In the genital cases cleanliness is important. The application of lead and opium lotion for twenty-four hours, followed by dithymol diiodide powder, often acts admirably. A saturated aqueous solution of pyoktanin blue, painted on twice daily, also hastens recovery. Tonics, particularly arsenic and phosphide of zinc, may prove valuable in the recurrent cases. C. J. White has found hexamethylenamine a serviceable remedy. In one sharply localized and exceedingly troublesome case of this type I found superficial freezing with carbon

dioxide snow valuable. It is probable that the benefit was a result of the hyperemia which followed the application of the refrigerative agent. Stelwagon recommends mild galvanism.

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HERPES ZOSTER.

Synonyms.—Shingles; Zoster; Zona.

Definition.—An acute inflammatory disease characterized by the occurrence of irregularly outlined groups of vesicles which are distributed along the course of one or more of the peripheral sensory nerves.

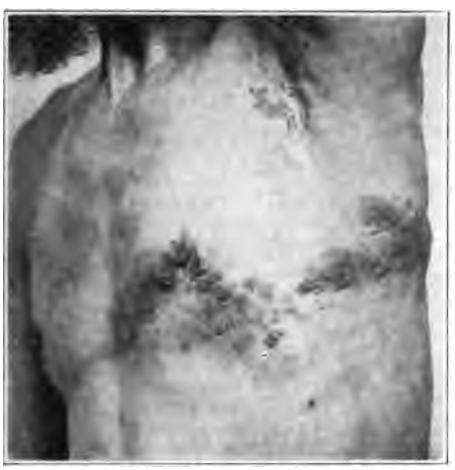

Fig. 147.—Herpes zoster of the usual type.

Symptoms.—The malady occurs most frequently in individuals whose nerve resistance has been lowered by overwork, disease, or the long continued ingestion of certain drugs (particularly arsenic). The appearance of the eruption is generally preceded by a variable amount of systemic disturbance, and occasionally by pain of a neuralgic character in the affected region. The lesions, which are vesicles or papulovesicles, seated on slightly elevated erythematous bases, appear in successive crops along the course of the affected nerve. The number of patches varies from one or two to a dozen or more. Each patch con-

sists of from a half-dozen to a score of vesicles. In the milder cases, only a few lesions develop. These may persist for a week to a fortnight, drying up, forming crusts, and disappearing. In the more severe

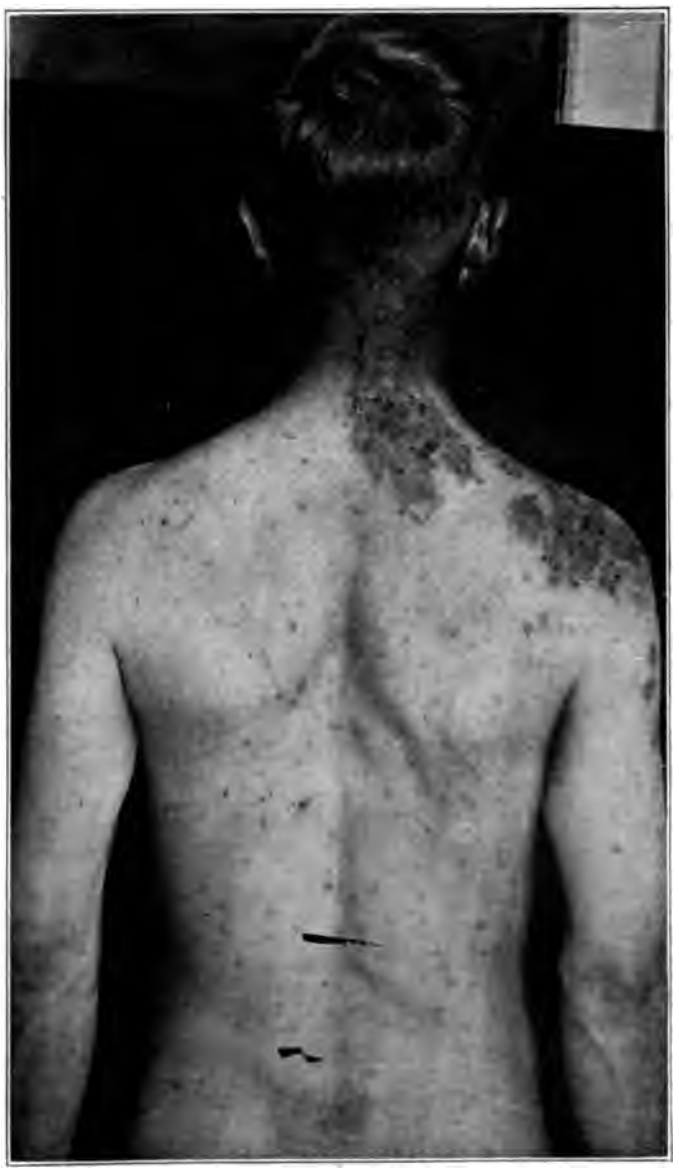

Fig. 148.—Herpes zoster brachialis, with associated vacciniform eruption. (Courtesy of Dr. C. C. Dennie.)

cases, the involvement may be quite extensive, new crops of lesions developing from day to day over the more distant nerve branches and twigs. The vesicles vary in size from a pinhead to a small pea, and

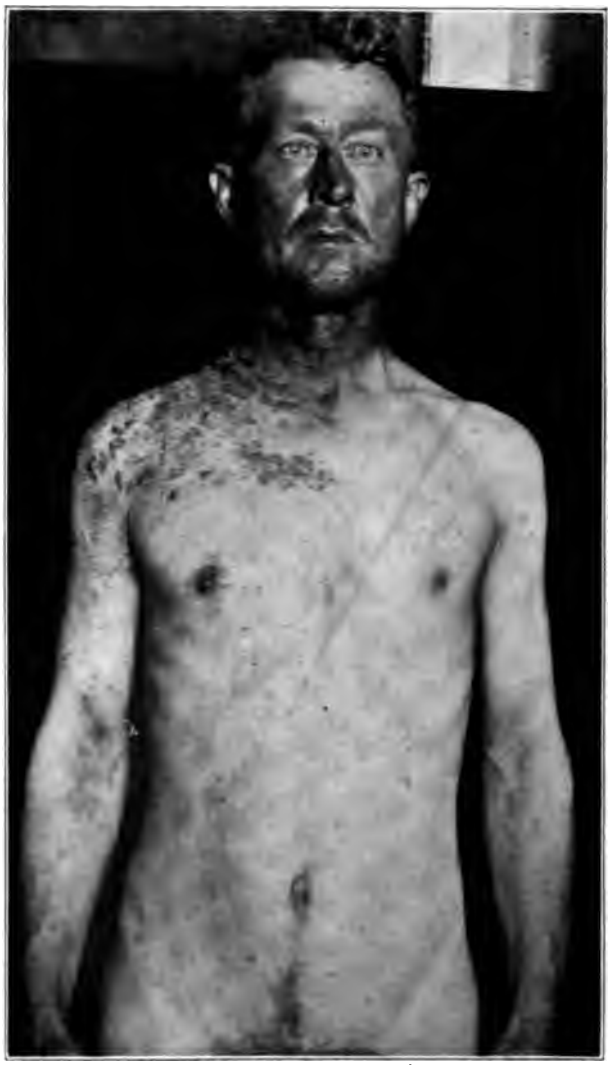

Fig. 149.—Herpes zoster brachialis, with associated vacciniform eruption. (Courtesy of Dr. C. C. Dennie.)

are usually filled with clear fluid. The walls are rather thick, and quite tough. As a result of pyogenic involvement the contents of the

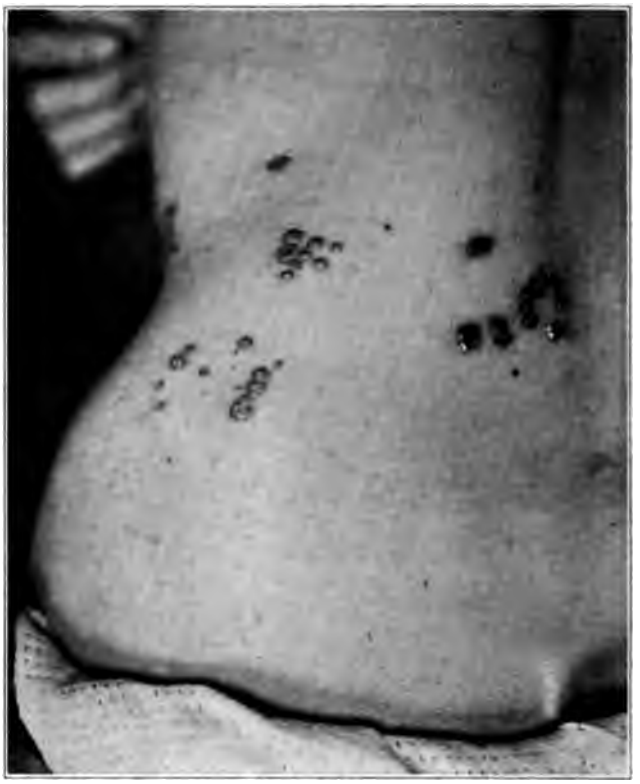

Fig. 150.—Herpes zoster gangrenosa.

Fig. 151.—Recurring herpes zoster of face.

vesicles may become seropurulent. In rare instances the disease may assume a hemorrhagic aspect, and the vesicles become filled with blood, or a mixture of blood, serum and pus. Baum and others have reported cases in which gangrene supervened. Lymphnode involvement is not infrequent. Pain is a variable symptom. In young and healthy individuals the affection may give rise to very little discomfort at any time during its course, but in elderly persons pain is generally a prominent feature throughout the attack, and neuralgic sequelæ are far from uncommon. The distribution of the eruption is practically always unilat-

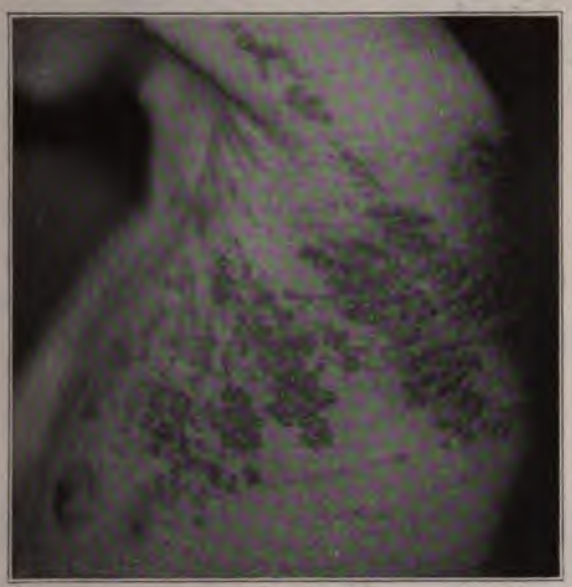

Fig. 132.—An extensive case of herpes zoster.

eral, although bilateral cases have been reported. Occasionally the disease may involve two widely separated regions at one time, and Stelwagon, Schamberg, and others have recorded instances in which typical outbreaks of zoster were accompanied by attacks of generalized herpes. The amount of resultant scarring varies, and is most marked on the forehead and in the hemorrhagic and gangrenous cases. The sites of predilection are the thoracic, lumbar, brachial, and supraorbital regions.

Etiology.—The disease occurs most frequently during cold, damp weather. Arsenic may act either as an exciting or supplemental factor. Small epidemics are not uncommon. Head and Campbell have demonstrated that the disease invariably follows lesions of the posterior

ganglia, and these investigators are of the opinion that the cells in this locality are comparable to those in the anterior horn of the cord. In cases involving the head the Gasserian or geniculate ganglia are implicated. The distribution of the eruption is entirely dependent upon the distribution of the particular fibers involved. Lesions of the

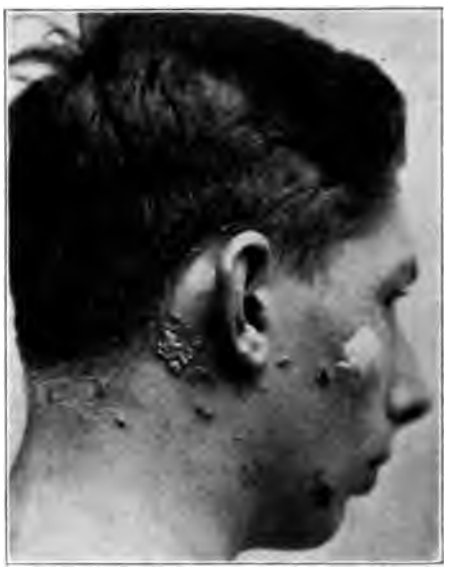

Fig. 153.—Herpes zoster. (Courtesy of Dr. H. C. Baum.)

Fig. 154.—Herpes zoster.

Fig. 155.—Herpes zoster of the frontal region. (Courtesy of Dr. H. C. Baum.)

ganglia may result from any one of a number of causes. Hemorrhage is the most frequent, but trauma, infection, and cancerous involvement are not uncommon. Head's conclusion that the affection is an acute specific disease of the nervous system with secondary cutaneous changes is very probably correct. The causative agent is probably microbic in a considerable percentage of the cases. The occurrence of epidemics tends to support this theory. The results of the recent work of Rosenow and Oftedal would indicate that the causative agent is a streptococcus, which gains entrance into the circulation through diseased tonsils or pyorrheal pockets, and which possesses an elective affinity for the posterior root ganglia. These investigators found the lesions of the ganglia to consist chiefly of hemorrhages and round-cell infiltration, usually most marked just beneath and outside the capsule and sur-

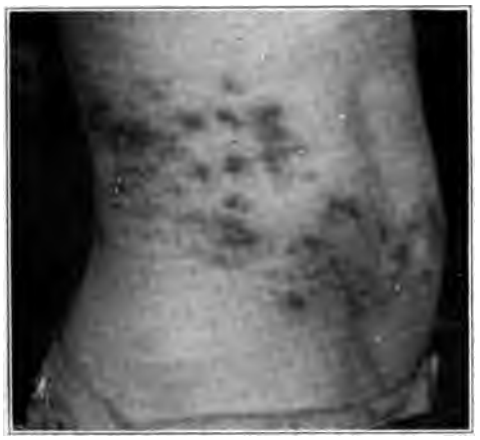

Fig. 156.—Herpes zoster.

rounding areolar tissue and along the sheath of the corresponding nerve. The blood vessels commonly showed marked congestion, and at times were completely or partially filled with mononuclear and polynuclear leucocytes. Gram positive diplococci and short chains were found to occur quite constantly in the areas showing lesions in and about the ganglia, but not in the normal portions. Cocci were found in these lesions in cultures and sections, when absent in the blood and other tissues. The peripheral vesicles in the experimental studies contained no organisms. Head found a marked lymphocytosis of the spinal fluid, which persisted for several weeks, in every case examined.

Pathology.—The vesicles are deeply seated, multilocular, and involve the lower rete and even the papillary layer. The cavities are filled with

serum, disorganized prickle cells, and leucocytes. The degenerated epithelial cells sometimes bear a striking resemblance to protozoa, and have been mistaken for these parasites.

Diagnosis.—The character, distribution, and course of the eruption, together with the frequent association of neuralgic pain, are distinct-

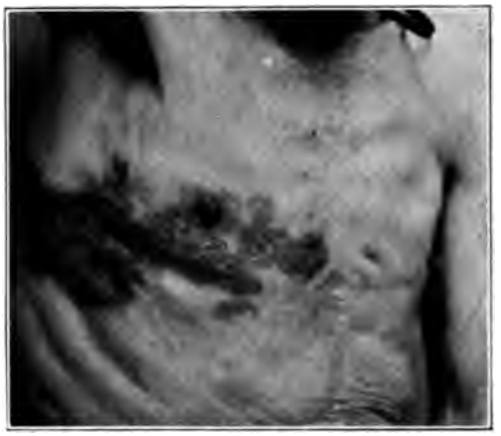

Fig. 157.—Pigmentation following herpes zoster. (Courtesy of Dr. John W. Perkins.)

Fig. 158.—Herpes zoster, showing a characteristic vesicle. Low magnification.

ive. For differentiation from herpes simplex, which it may occasionally resemble, see that disease.

Prognosis.—One attack usually confers immunity, although Grindon and others have reported instances of repeated attacks. In the majority of instances the disease runs an acute course, and the symptoms disappear in from a fortnight to a month. The hemorrhagic and gangrenous cases are more serious, and in these the prognosis should be guarded. In herpes zoster of the supraorbital region the eye may become involved, and corneal perforation result, or meningitis may supervene. Cicatricial alopecia is not uncommon, and I have encountered one case in which a typical alopecia areata developed in the affected region.

Treatment.—A mercurial purge, consisting of two or three Compound Cathartic Pills, U. S. P., should be given at the outset. In extensive and severe cases the patient should be very careful to avoid draughts, and sudden extremes of temperature. Internally the administration of phenacetine, aspirin or sodium salicylate sometimes hastens recovery. Bulkley recommends zinc phosphide, both during and following the attack. Occasionally, resort must be had to morphine to relieve the pain. Locally, the use of counterirritation, or the ethyl chloride spray, over the affected ganglion, often is extremely helpful. Of the topical applications, I have found an antiseptic dusting powder, such as dithymol diiodide, or one consisting of equal parts of boric acid, starch and talc, applied freely twice daily and covered with a heavy layer of cotton batting, attached by means of adhesive straps and a bandage, the most satisfactory dressing. Should suppuration occur, the lesions may be incised, drained, painted with tincture of iodine, and the dressing reapplied. After the crusts have formed, an ointment may be needed to soften and lubricate the affected skin, and for this purpose carbolized zinc oil may be employed. For the relief of the neuralgia, which sometimes accompanies and frequently follows the disease, I have found a mild galvanic current (1 to 5 m.amp.), as recommended by Stelwagon, almost a specific. The positive electrode is placed over, or near, the affected ganglion, and the negative electrode gently drawn along the course of the nerve, from its terminal filaments backward toward the spinal cord. The most satisfactory results can be secured by stroking only in the one direction, and the séances should extend over a period of ten or fifteen minutes each day until recovery is complete. High frequency currents also prove serviceable at times, and I have found dry heat, obtained from a high power incandescent lamp, valuable.

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POMPHOLYX.

Synonyms.—Dysidrosis or Dyshydrosis; Cheiropompholyx.

Definition.—An acute inflammatory affection, limited to the hands and feet, and characterized by the occurrence of crops of deeply seated vesicles and bullae.

Fig. 159.—Pompholyx, showing characteristic vesicles on palmar surface.

Symptoms.—The disorder was first described by Jonathan Hutchinson in 1871, although the first written report was made from independent observations by Tilbury Fox, in 1873. The eruption is as a rule symmetrical, and the palms and lateral surfaces of the fingers are the sites of predilection. The soles are often attacked, however, and in a certain percentage of cases the dorsal surfaces of the hands also are involved. The disease is a common one in the Southern States (Dyer),

and is encountered with comparative frequency throughout the West and Middle West.

Fig. 160.—Pompholyx. The eruption is unusual, in that it involves only the central portions of the palms.

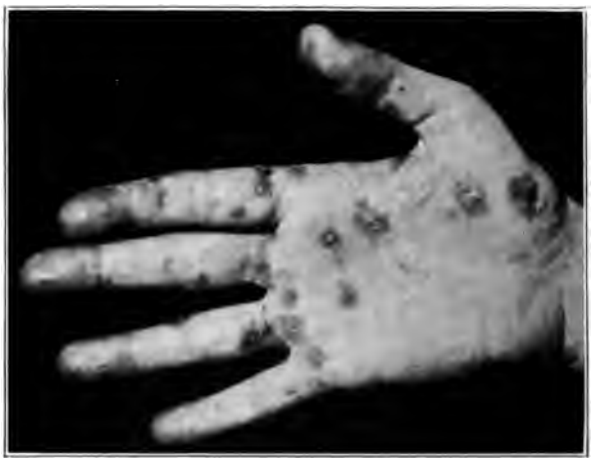

Fig. 161.—Pompholyx. The lesions are unusual in that they are slightly pigmented.

The development of the characteristic eruption is usually preceded by symptoms of burning and itching, with some accompanying hyper-

Fig. 162.—Pompholyx, desquamative stage.

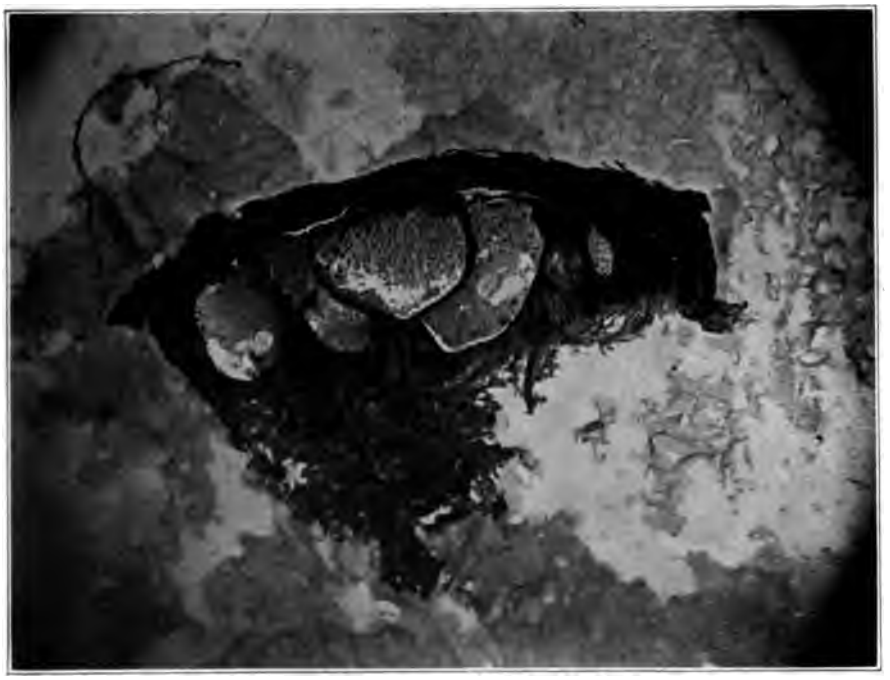

Fig. 163.—Pompholyx, showing typical multilocular lesion. Low magnification.

emia of the parts. In the course of a few hours the vesicles become apparent. They vary from a pinpoint to a pinhead in size at first. On the lateral surfaces of the fingers and toes they seldom increase much in size, but on the palms and soles they may attain a diameter of 0.5 to 1 cm., or even greater. Coalescence is not infrequent. New crops of vesicles appear from time to time, and the attack may extend over a period of from four to six weeks. As a result of second-

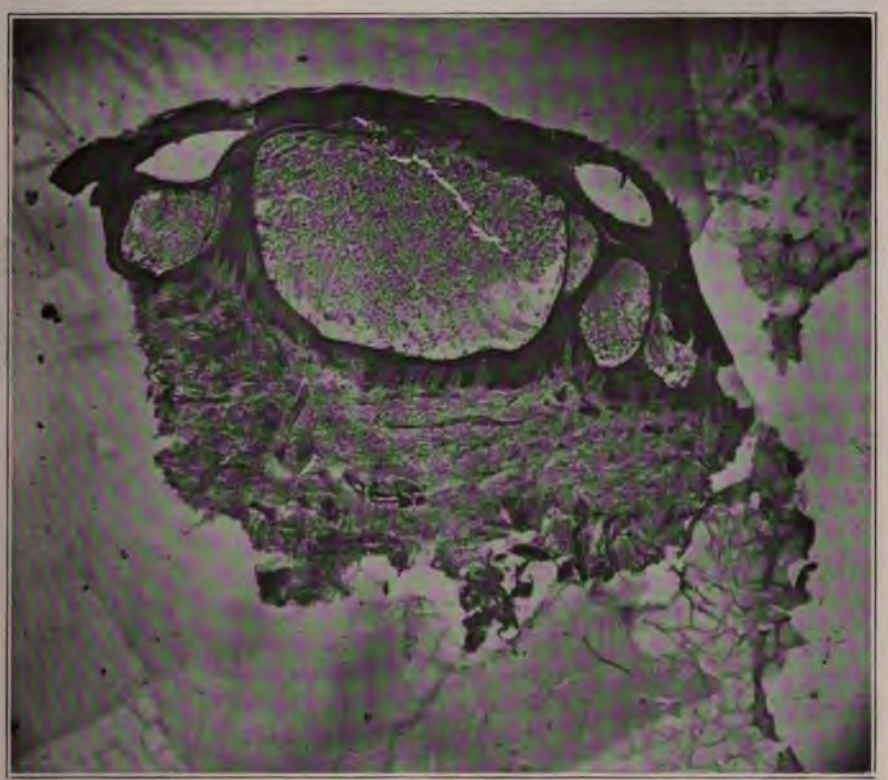

Fig. 164.—Vesicles in pompholyx. Low magnification.

ary pyogenic involvement, the contents of many of the lesions become purulent in the course of a few days. The individual vesicles persist for several days or a fortnight, when the contents are absorbed and the lesions regress, with more or less resultant exfoliation of the overlying stratum corneum. Spontaneous rupture seldom occurs.

Etiology.—The cause of pompholyx is not definitely known. The malady occurs most frequently between the second and fourth decades

of life, and in individuals whose vitality has been lowered by ill health or overwork. Persons who use tobacco and coffee to excess are especially susceptible to attacks. Unna found a bacillus in all of the lesions examined by him, and he believes it to be the exciting cause of the disease. Unfortunately no one has since been able to confirm the results of his investigations. It is very probable that the disorder is of nervous origin.

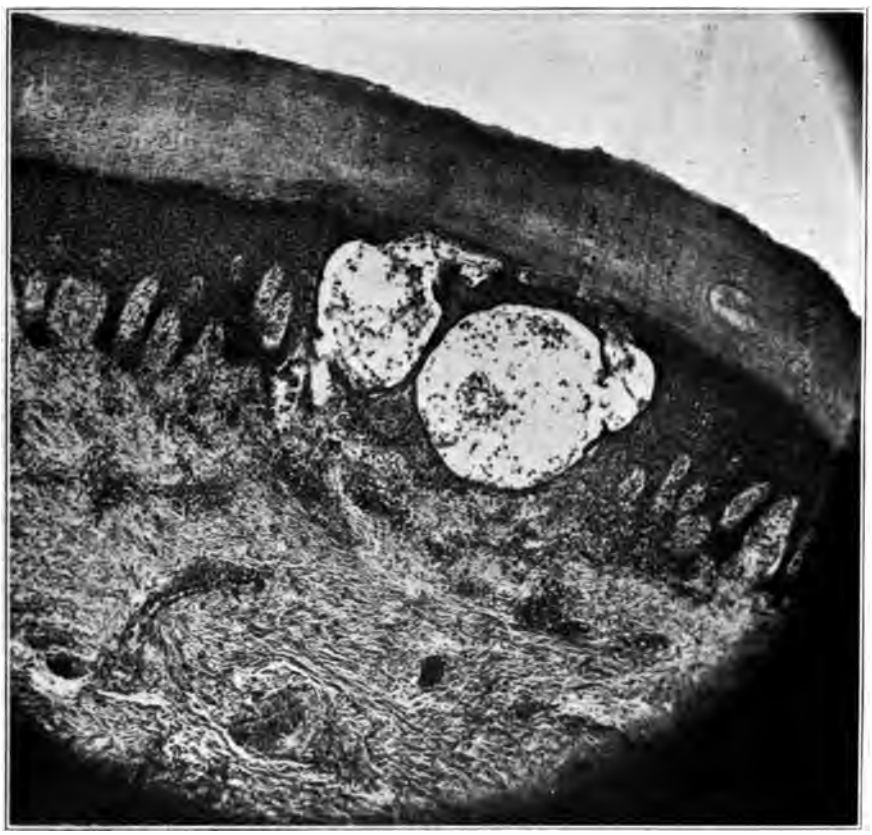

Fig. 165.—Early lesions in pompholyx. Low magnification.

Pathology.—The vesicles develop in the prickle layer, and are filled with serum. Later, as a result of pyogenic invasion, the fluid may become purulent. At one time the lesions were supposed to be associated with the coil gland ducts (hence the name "dysidrosis"), but the investigations of Robinson, Unna, and others, have served to prove that

this view is incorrect. The inflammatory changes in the derma are comparatively slight.

Diagnosis.—The deep-seated character of the lesions, their symmetrical and characteristic distribution, and their occurrence in crops, all are distinctive. In vesicular eczema the lesions are superficial, crowded, interspersed with papules, rupture easily, and itch intensely. There is more or less accompanying infiltration and there is seldom if ever, symmetrical involvement of both palms, or of the palms and soles. It is extremely probable that ringworm of the palm is occasionally confused with pompholyx, particularly in those cases in which only one hand is involved.

Prognosis.—The duration of an attack is self-limited, and seldom lasts longer than a few weeks. Recurrences are not uncommon, however, particularly in debilitated individuals.

Treatment.—The general health should receive attention. Rest, with freedom from worry, is often essential. A mercurial purge, followed by a saline, is usually to be advised at the outset. I have found the alkaline diuretics, combined with small amounts of sodium bromide, valuable. Tonics often prove serviceable. Of the local applications, mild, soothing astringents, such as aqueous solutions of aluminum acetate (2 to 5 per cent), lead and opium lotion, or diachylon ointment should be prescribed. If the tension gives rise to much suffering, the lesions may be incised and drained. In the course of a few days, carbolized zinc oil, alone or alternated with calamine lotion, may be employed.

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DERMATITIS HERPETIFORMIS.

Synonyms.—Duhring's disease; Hydroa herpetiforme; Dermatitis multiformis; Herpes gestationis; Pemphigus prurigineux.

Definition.—A chronic, relapsing, inflammatory disease characterized by the occurrence of erythematous, papular, vesicular, bullous or pustular lesions, which exhibit a tendency toward grouping and are as a rule accompanied by intense itching and burning.

Symptoms.—An attack is usually ushered in by slight constitu-

tional symptoms, but these are seldom of sufficient severity to arouse anxiety. The clinical appearance of the disease varies with the character of the predominating lesions, although all of the various types possess certain features in common. Itching is almost invariably pres-

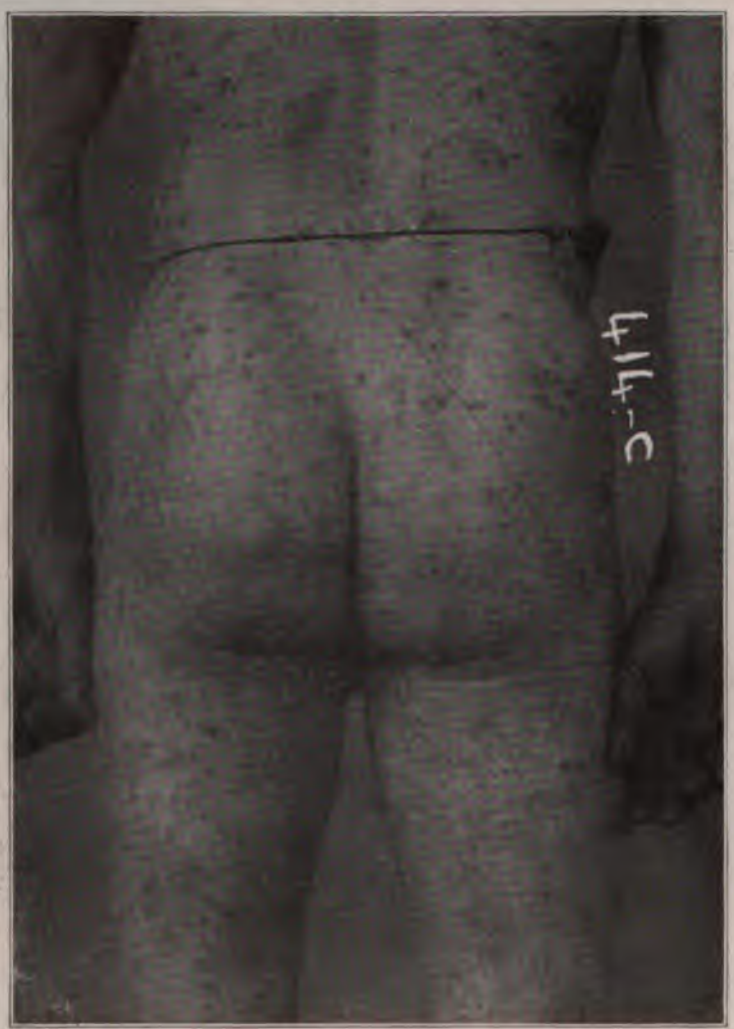

Fig. 166.—Dermatitis herpetiformis. (Courtesy of Dr. Isadore Dyer.)

ent, and is an exceedingly distressing and troublesome symptom. Sensations of burning and tension also are frequent. The eruption may be erythematous, papular, vesicular, bullous, pustular or mixed. The

vesicular is the most characteristic form, but the mixed is the commonest. The lesions develop rather suddenly, and tend to arrange themselves in groups and circles, which spread by peripheral extension. In the vesicular, bullous and pustular forms the lesions, which are of ir-

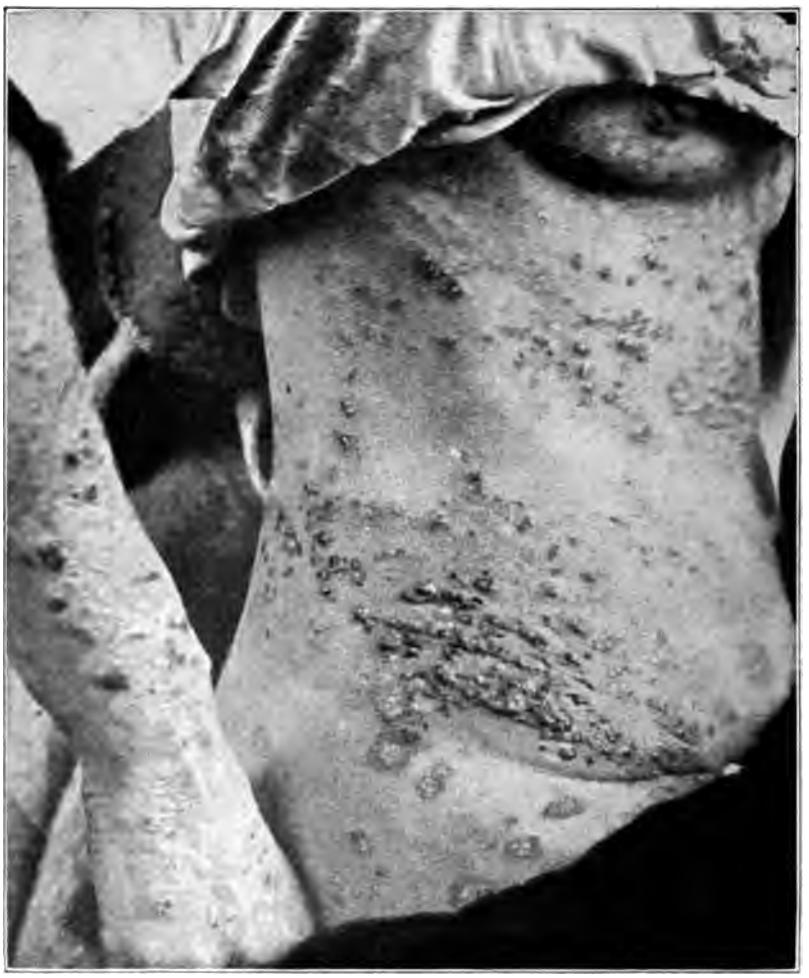

Fig. 167.—Dermatitis herpetiformis. Acute, erythemato-vesicular and pustular varieties in combination. (After Duhring.)

regular shapes and sizes, possess thick, tough walls, and seldom if ever, rupture spontaneously. Ulceration occurs only as a result of secondary infection or trauma. The disease is a variable and erratic one, the lesions frequently changing in character from time to time, even

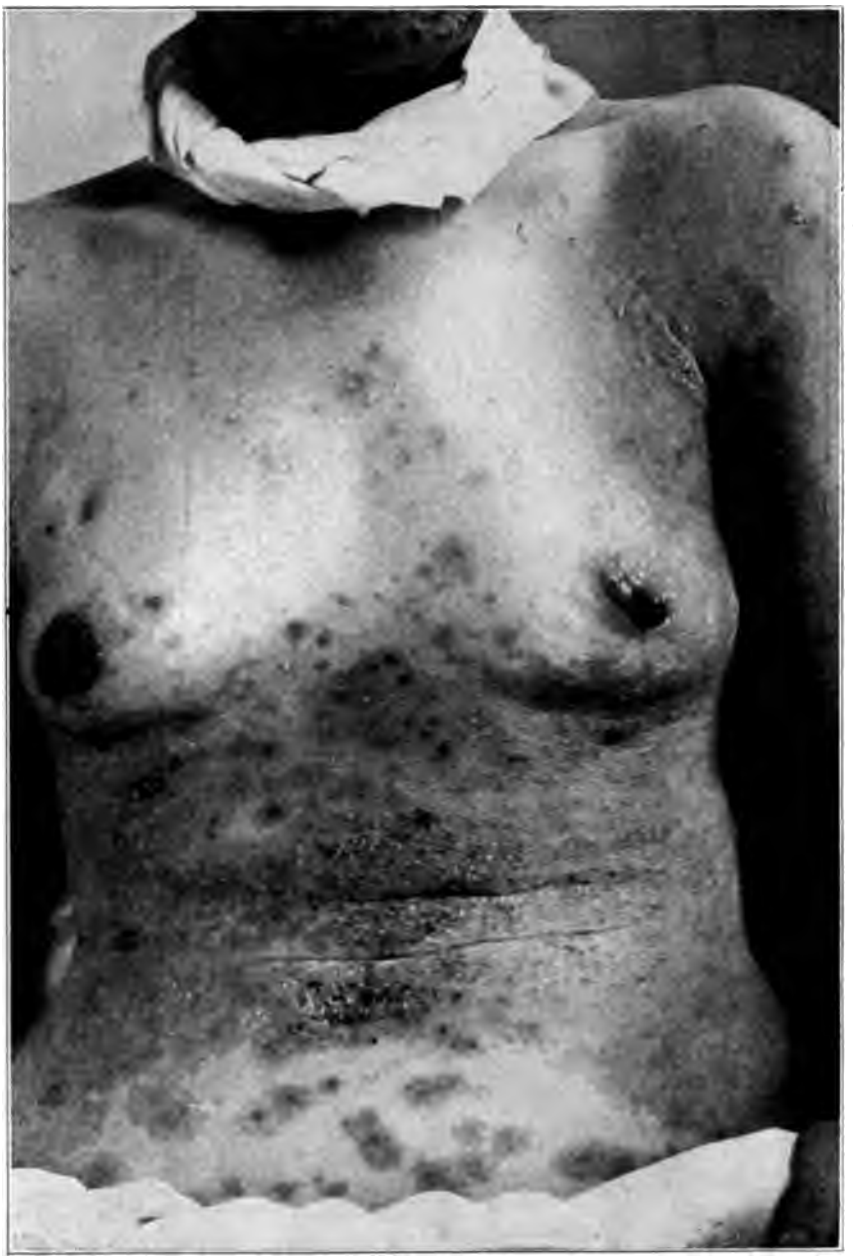

Fig. 168.—Dermatitis herpetiformis of the acute, erythemato-vesicular variety. (After Duhring.)

during the course of an exacerbation. An attack may be prolonged for weeks or months by the constant development of new lesions, but as a rule the outbreaks are interspersed with periods of comparative quiescence. The eruption is as a rule roughly symmetrical, and the mucous surfaces are occasionally involved. In children the lesions are usually vesicular or bullous, and change in type is less frequent than in adults.

As a result of secondary infection, following scratch abrasions, the inguinal, epitrochlear, and axillary lymphnodes may become palpable and tender. The disease seldom attacks strong, vigorous individuals.

Fig. 169.—Dermatitis herpetiformis of the vesicular variety.

The victims as a rule are nervous, poorly nourished or debilitated individuals.

Etiology.—The direct cause of dermatitis herpetiformis is not known. The disease is a comparatively rare one, and occurs oftenest in adult males. It has developed following vaccination in several instances. In Roussel's historic case it was possibly reflex in origin, and a permanent cure was secured by circumcising the little patient. Indicanuria and eosinophilia are almost constantly present, as Engman and others have shown, but both of these conditions are of frequent occurrence in other cutaneous disorders also. Pregnancy is a powerful

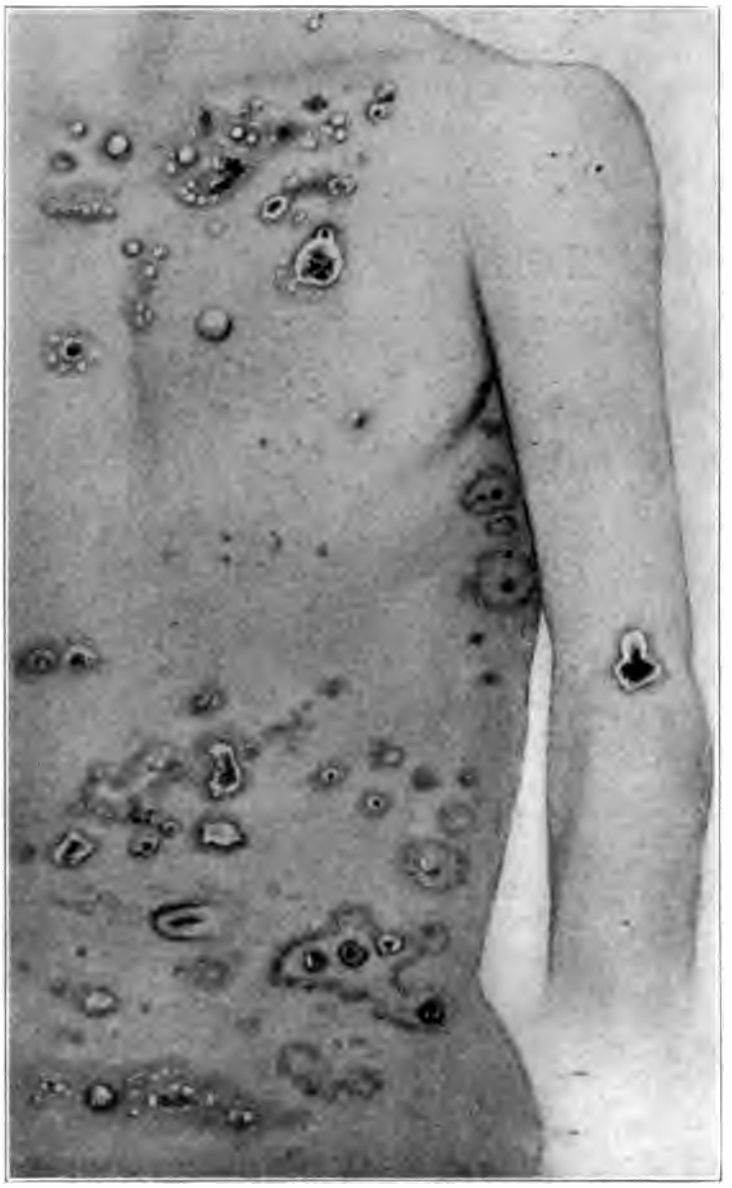

Fig. 170.—Dermatitis herpetiformis of the vesico-bullous variety. (Dr. A. R. Robinson's case, after Duhring.)

Fig. 171.—Dermatitis herpetiformis of the vesico-bullous type. (After Duhring.)

supplementary factor in some instances. Johnston believes that autointoxication may be a factor. Careful search for focal infections (tonsillar and apical) should always be made. In Irvine's patient, the removal of an infected tonsil was followed by marked improvement of the

Fig. 172.—Dermatitis herpetiformis, vesicular type.

Fig. 173.—Dermatitis herpetiformis. (Courtesy of Dr. Isadore Dyer.)

skin; and Chipman and others have reported similar instances. No age is exempt. C. J. White has reported a typical case in a seven year old boy.

Pathology.—The inflammatory process probably involves the papil-

Fig. 174.—Dermatitis herpetiformis; vesicular and papular variety; showing marked tendency toward pigmentation and scar formation. (Courtesy of Dr. Grover W. Wende.)

lary region primarily, and is characterized by vascular dilatation and perivascular infiltration (lymphocytes, polynuclears, and occasionally eosinophiles and plasma cells) of the intrapapillary vessels, with edema and swelling of the papillary bodies. In the vesicular and bullous types, the lesions form in the lower regions of the rete or at the corio-epidermal juncture, and contain an admixture of serum, fibrin, lymphocytes, leucocytes, and eosinophiles. As Unna has said, the epidermis plays only a passive role in the histopathology of dermatitis herpetiformis.

Diagnosis.—The disease is to be differentiated from pemphigus, erythema multiforme, and eczema. In pemphigus the bullae are usually large and thin-walled, exhibit no tendency toward symmetry, develop from apparently sound skin, and itching is slight or entirely lacking. The lesions of erythema multiforme exhibit a predilection for the dorsal surfaces of the hands and feet, give rise to but slight subjective symptoms, and run an acute course. In generalized cases of eczema, the lesions usually bear little or no resemblance to those of dermatitis herpetiformis. The individual patches are persistent and the vesicles are small, superficial, and closely grouped.

Prognosis.—The severity of an attack can usually be ameliorated, but permanent relief from the disease can never be promised. The erythematous and vesicular types are the least persistent. The outlook is better in children than in adults.

Treatment.—The patient's general condition should be thoroughly investigated, and every possible source of reflex irritation removed. Of the various internal remedies, arsenic stands first. In a few instances I have found sodium cacodylate (gr. iii - 0.2, intramuscularly, on alternate days) valuable. Thyroid also is beneficial at times, but it is to be employed circumspectly. Quinine proves serviceable in some instances. Injections of autogenous serum may be tried in rebellious cases, and favorable results have been reported following injections of Ringer's solution. Of the various external applications that have been recommended, I have found lotions, and particularly lotions containing carbolic acid and tar, the most valuable. The ordinary calamine mixture, to which has been added carbolic acid (.5 to 2 per cent) and liquor carbonis detergens (5 to 20 per cent) serves admirably at times. Alkaline, bran, or sulphuretted potash baths are very comforting in some instances. On emerging from the water the skin is carefully dried by tapping with a rough towel, and Anderson's antipruritic powder freely applied. Duhring strongly recommends an ointment containing sulphur (5 to 10 per cent). Bland, soothing, greasy mixtures, such as

carbolized zinc oil, also are helpful at times. Patients often secure much relief by tearing off the tops of the vesicles and bullae. Consequently in cases of this type it often is advisable to incise the lesions, and thus ameliorate the symptoms of tension and burning. Excoriated areas should be protected by a mild, antiseptic ointment, such as ammoniated mercury (2 per cent) in vaseline or cold cream.

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IMPETIGO HERPETIFORMIS.

Definition.—An inflammatory disease of the skin, occurring usually in puerperal women, and characterized by the occurrence of irregularly shaped, or circinate groups of small pustules which tend to coalesce, and are accompanied by symptoms of serious systemic disturbance.

Symptoms.—The malady is a rare one, and was first described by F. Hebra, in 1872, who based his report on a study of five cases, four of which terminated fatally. The eruption, which consists of groups of miliary pustules, is in many instances confined to the genito-crural regions, and the inner surfaces of the thighs. The older lesions tend to become dry and crusted in the course of a few days or weeks, and as the central portions of the affected areas heal and clear, extension occurs by the formation of new patches at the periphery. The mucous surfaces are usually involved. An outbreak is accompanied by chills and marked fever, and in a large percentage of cases the disease ultimately terminates fatally. The vast majority of the reported instances have occurred in females in the puerperal state; but Hartzell has described an example in a woman of 84, and a few cases in men have been recorded.

Etiology.—The cause of impetigo herpetiformis is unknown.

Opinions differ regarding the results of bacteriologic investigation.

Pathology.—The papillae are swollen. The intrapapillary blood and lymph vessels are dilated and there is profuse infiltration (principally small round cells) throughout the upper regions of the derma. There is a decided acanthosis, and the prickle cells in the vicinity of the lesions are swollen, with intercellular collections of leucocytes. Cocci and other bacteria of various kinds have repeatedly been found in the pustules. The latter are situated in the deeper parts of the rete, their bases often resting on the basal layer of cells.

Diagnosis.—The malady may be confused with dermatitis herpetiformis and with pemphigus. Its occurrence generally in parturient women, and the accompanying symptoms of grave systemic involvement are valuable differential points. Occasionally cases are encountered, like the one reported by Heitzmann, in which the disease appears to lie midway between impetigo herpetiformis and pemphigus.

Prognosis.—The prognosis always is grave. Even though the patient should recover from one attack, recurrences are not infrequent. The majority of the reported cases have ultimately terminated fatally.

Treatment.—The condition of the kidneys should be carefully investigated. Supportive measures are usually indicated. Mild antiseptic applications, such as lotio nigra and weak ammoniated mercurial ointment may do good. Autogenous serum injections have proved valuable in a few instances (Linser).

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PEMPHIGUS.

Definition.—Pemphigus is an acute or chronic disease characterized by the occurrence of successive crops of bullae which develop suddenly, often on apparently normal skin, and which may be accompanied by constitutional disturbance of varying degree.

Symptoms.—Clinically, pemphigus may be separated into four distinct types: pemphigus acutus, pemphigus chronicus, pemphigus foliaceus, and pemphigus vegetans.

Pemphigus Acutus.—Several pathologic conditions, which were formerly included under the heading of acute and contagious pemphigus, are now generally believed to be only aberrant examples of

impetigo contagiosa. Chief among these are *pemphigus neonatorum, pemphigus contagiosus,* and *benign pemphigus contagiosus tropicus.* Hardy and, later, Tommasoli, described a *pemphigus virginum,* occurring in young and generally chlorotic girls, and characterized by crops of large vesicles and bullae which developed suddenly on the limbs, and soon ruptured and dried, forming yellowish crusts. Fresh

Fig. 175.—Chronic pemphigus. (Courtesy of Dr. J. W. Perkins.)

crops of lesions appeared from time to time, and the disease sometimes persisted for several weeks. Subjective symptoms were slight or absent, and the disease was essentially benign in character.

Pernet and Bullock, Bowen, Grindon, Pollitzer, and others have reported instances of acute pemphigus occurring in butchers and others whose occupations render them liable to infection from animals and their products. The constitutional symptoms in these cases are usu-

ally severe, and the outcome in many instances is fatal. The bullae vary from 1 to 10 cm. in diameter, and oftentimes contain an admixture of blood and serum. As a result of coalescence, and subsequent abrasion, large denuded areas are occasionally formed which are quite tender and painful, but seldom give rise to much itching. The mucous surfaces are generally involved. In some instances the masses of decomposing epidermis give rise to a very offensive odor. Death may result from acute septicemia or from exhaustion.

Pemphigus Chronicus.—This form, which is also known as *pemphigus vulgaris,* is the most common variety. Lesions may be present practically all of the time, new blebs developing as the older

Fig. 176.—Chronic pemphigus.

bullae dry up and disappear, or the disease may be characterized by outbreaks which last a few weeks or months and are alternated with periods of complete or comparative quiescence. The lesions are rounded or oval in outline, thin-walled, and usually tense, with translucent contents. Zeisler has found the bullæ flaccid in the serious cases, and tense in the milder ones. In number they vary from ten or a dozen up to a hundred or more. The distribution of the eruption is generally bilateral and roughly symmetrical, although in rare instances it may involve only the face, or one or two limbs. As a rule, there is not much tendency to grouping, although Allen, Crocker and others have reported circinate cases. The trunk and limbs are the sites of predi-

lection, although no region is exempt. The mucous membranes seldom escape. The bullae vary from 1 to 10 cm. in diameter, and coalescence is not uncommon. They develop suddenly on apparently normal or slightly reddened areas, increase in size little if at all, and are never infiltrated. A pink areola usually develops at the end of twenty-four or forty-eight hours, and is probably a result of pyogenic involvement of the bullous contents. In severe cases the lesions may con-

Fig. 177.—Chronic pemphigus.

tain small amounts of blood. There is no scarring, although milium-like lesions, and palmar and plantar thickening may develop in long-standing cases. Outbreaks of pemphigus are often preceded by systemic symptoms, particularly sensations of chilliness, followed by fever. Burning and itching are usually present, but vary greatly in degree. Relapses are common, and recurrences almost the rule.

Pemphigus Foliaceus.—This variety may be more or less character-

istic from the beginning, or it may commence as an acute or chronic pemphigus, a dermatitis herpetiformis, a generalized edema of the skin, or even a dermatitis exfoliativa of Wilson. Clinically it is characterized by the formation of large, flaccid bullae which develop rapidly and soon rupture, usually at some marginal point, leaving a moist raw surface covered with seropurulent fluid. The eruption involves

Fig. 178.—Pemphigus foliaceus in a colored man. (Courtesy of Dr. C. C. Dennie.)

the entire surface in the majority of instances. The bullous contents are purulent from the very first. Nikolsky has shown that there is a diminution of the adhesion between the stratum corneum and the subjacent prickle layer (Nikolsky's sign), and this probably accounts, in a measure at least, for the fragile, semidistended character of the bullae. The crusts may be thin and adherent, but usually they are

thick and easily detached. The foul smelling pus in which they are constantly bathed imparts to them a peculiar, distinctive, sickening odor. The involved mucous surfaces are denuded and raw, and in severe cases the hair and nails may be exfoliated. The skin is infiltrated and thickened. Constitutional symptoms of slight degree may be present throughout the course of the disease. As a rule the subjective symptoms are comparatively trifling. The course of the disease is essentially chronic. Exacerbations, followed by periods of comparative quiescence, are not unusual, but the skin seldom clears up between the attacks as in ordinary pemphigus.

Pemphigus Vegetans.—This variety was first described by Neumann, in 1886. The disease begins with the formation of bullae on a

Fig. 179.—Pemphigus foliaceus. (Courtesy of Dr. C. C. Dennie.)

mucous surface, generally the mouth or pharynx. The lesions rupture readily, and frequently on examination only the raw, moist bases are to be seen. Ultimately bullae develop elsewhere, however, and not only the mouth and throat, but also the nares, genitals, chest, abdomen, and other parts of the body may become involved. At first the symptomatology varies but little from that of pemphigus vulgaris, but in the course of a few weeks, some of the lesions, instead of drying up and disappearing, persist, and the bases become ulcerated, or, if they be located in a warm, moist region, as the axillary and inguinal folds, papillary excrescences resembling condylomata, spring up. These excoriations and ulcers are prone to develop at various pressure points, and seldom exhibit any tendency toward healing. Frequently satellite vesicles and bullae appear around them. The condyloma-

like vegetations secrete a viscid, foul-smelling, seropurulent fluid, and the sodden, decomposing masses of epidermis give rise to an exceedingly offensive, fetid odor. The mouth lesions are very distressing and troublesome, and in severe cases mastication is almost impossible.

Fig 180. Pemphigus vegetans. (Courtesy of Dr. E. J. Angle.)

Etiology.—Judging from the results of the researches of Bulloch and others it is extremely probable that the so-called "acute pemphigus of butchers" is due to a specific organism, a diplococcus.

The cause of chronic pemphigus is unknown. Goldenberg, Highman, and Hazen each found the lesions autoinoculable.

The bacteriology of pemphigus foliaceus has been investigated by Hazen, Low, Dennie and others. Hazen and Dennie repeatedly secured pure cultures of the bacillus pyocyaneus from their cases, and Low from one of the three studied by him. Judging from these reports, and from my observations on Dennie's case and on one of my own, I believe that pemphigus foliaceus is pemphigus vulgaris plus a bacillus pyocaneus infection.

It is possible that pemphigus vegetans is likewise a variant of pemphigus vulgaris.

Pathology.—The papillae are swollen and edematous, with dilatation of the intrapapillary vessels, and more or less perivascular exudation. The location of the bullous cavity varies considerably. The fact that scarring very seldom occurs would indicate that the lesions are usually, if not invariably, epidermal. In the majority of instances the cavities lie just beneath the stratum corneum, although they are sometimes separated from it by a few loosely adherent prickle cells. In the papillomatous lesions of pemphigus vegetans, the principal changes are to be found in the upper derma. Both blood and lymph vessels are greatly enlarged, with pronounced cellular infiltration. The papillae are enormously hypertrophied, and there is a variable degree of acanthosis.

Diagnosis.—The diseases that are most likely to be confused with pemphigus are erythema bullosum, dermatitis herpetiformis, and syphilis. In erythema bullosum the systemic disturbance is trivial or altogether lacking, the lesions develop on nodules or erythematous plaques, the dorsal surfaces of the hands and feet seldom escape, and the distribution of the eruption is never general. In dermatitis herpetiformis the lesions are often a combination of vesicles, papules and pustules, they always develop on an erythematous, sometimes slightly elevated base, if vesicular they are smaller and rupture much less easily than those of pemphigus, and itching is always a prominent and distressing feature. In the bullous syphiloderm, as occasionally observed in infants, and in condylomata, which might be mistaken for pemphigus vegetans, other signs of syphilis are invariably present.

Prognosis.—The prognosis in pemphigus should always be guarded. In the acute, foliaceus, and vegetating varieties the outlook is particularly serious. In the ordinary chronic form, relapses are common,

and recurrences the rule rather than the exception, but in the majority of instances the patient's condition can be greatly benefited by appropriate medication.

Treatment.—The general health should always receive attention. In severe or extensive cases, the patient should be kept in bed, on an air or water mattress. Tonics, and particularly cod-liver oil, arsenic, and iron, quinine and strychnine, often prove helpful. Of the internal remedies which are supposed to exert a curative action, arsenic stands first. It can be administered in the form of Fowler's solution, by the mouth, sodium cacodylate, intramuscularly, or arsphenamine or neoarsphenamine, intramuscularly or intravenously. In my hands, arsphenamine, injected intramuscularly, has proved valuable.

In pemphigus foliaceus and pemphigus vegetans autogenous vaccines should always be tried. Injections of autogenous serum sometimes prove serviceable.

Of the local applications, carbolized calamine lotion, or better, calamine liniment, is soothing and comforting. Anderson's antipruritic powder often serves admirably. I have found the continuous application of large quantities of powder, as suggested by Engman and White, helpful. In the vegetating variety the lesions may be cleansed with benzine, followed by a weak formalin solution, and dithymol diiodide applied. In the intensely itchy cases it is often advisable to incise and drain the lesions. If there is much tension and soreness, zinc oil, containing carbolic acid (.5 per cent) and menthol (.5 per cent) may be prescribed. In cases presenting extensively denuded areas, and particularly in pemphigus foliaceus, resort may be had to the continuous bath.

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PEMPHIGUS FOLIACEUS.—*Nikolski*, thesis "Materiali k. Uchenigu o. Pemphigus foliaceus Kieff, 1896. — *Biddle*, Jour. Cutan. Dis., 1897, p. 203. — *Klotz*, Am. Jour. Med. Sc., Dec.,

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PEMPHIGUS VEGETANS.—*Neumann,* Vrtljhr. f. Dermat. u. Syph., 1886, xii, p. 54. — *Crocker,* Med. Chir. Trans., London, 1889, lxxii, p. 233. — *Hamburger and Rubel,* Bull. Johns Hopkins Hosp., 1903, p. 63. — *Hartzell,* Jour. Cutan. Dis., 1910, p. 111.

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DERMATITIS VEGETANS.

Synonym.—Pyodermatitis vegetans.

Definition.—A benign, inflammatory disease of the skin characterized by the occurrence of masses of exuberant granulation tissue which

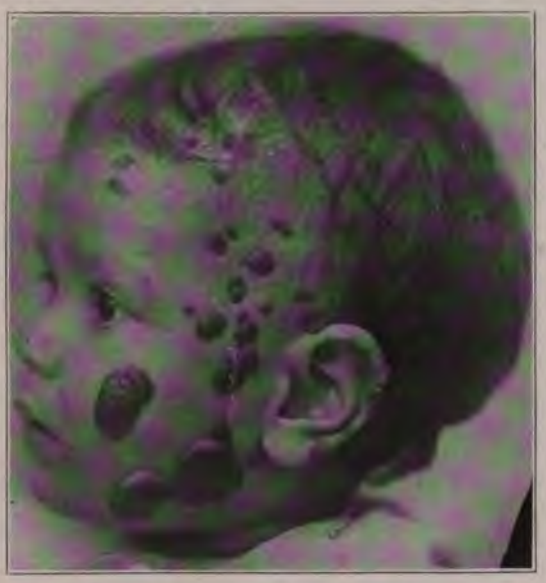

Fig. 181.—Dermatitis vegetans. (Courtesy of Dr. H. C. Baum.)

never arise independently but always develop upon the lesions of some preceding disorder, such as eczema or seborrheic dermatitis.

Symptoms.—The vegetating plaques, which vary greatly in size and distribution, develop on oozing, eczematous patches, and similar weeping surfaces. They are dark red in color, and bleed readily. They are constantly bathed in serum and pus. Crusting is not infrequent. In some instances the lesions bear considerable resemblance

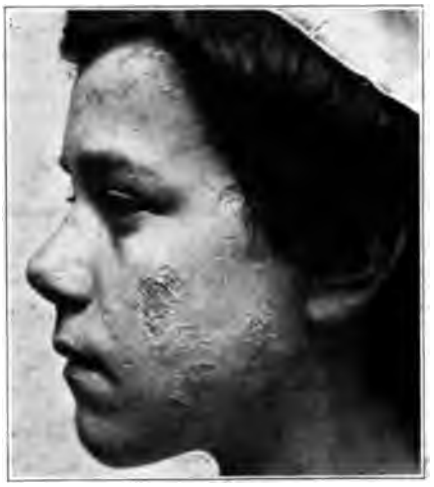

Fig. 182.—Scarring following dermatitis vegetans. (Courtesy of Dr. H. C. Baum.)

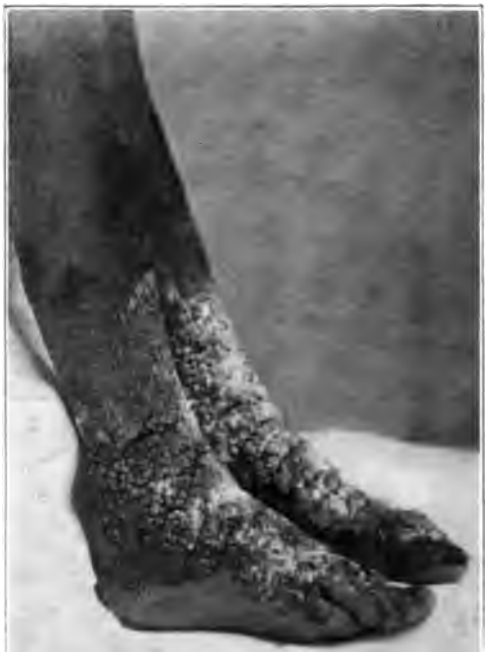

Fig. 183.—Dermatitis vegetans. (Courtesy of Dr. John W. Perkins.)

to closely grouped collections of granuloma pyogenicum tumors. The distribution of the plaques is wholly dependent upon that of the eruption which precedes them. Subjective symptoms are practically absent, and there is seldom if ever any constitutional disturbance. Oc-

Fig. 184.—Dermatitis vegetans. (Courtesy of Dr. John W. Perkins.)

casionally they involve only the face. The genital region is another favorite site. In an instance reported by Pusey they were irregularly distributed over the arms, back and chest. In King Smith's case the mouth, arm, and inguinal regions were involved, and the symptoms were not unlike those occurring in a mild case of pemphigus vegetans. Judging from the histories of the reported cases, it is exceedingly

Fig. 185.—Dermatitis vegetans. (Courtesy of Dr. Eugene Carbaugh.)

Fig. 186.—Dermatitis vegetans. (Courtesy of Dr. John W. Perkins.)

probable that the condition is invariably a secondary one, resulting from the bacterial involvement of moist lesions of a certain type which may occur in any one of a number of cutaneous disorders. The presence of certain strains of the yellow staphylococcus possibly constitutes the principal exciting factor.

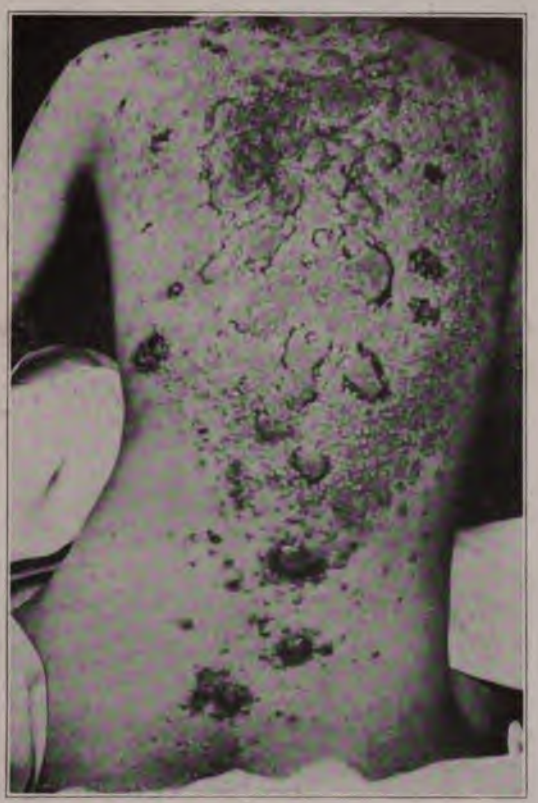

Fig. 187.—Dermatitis vegetans. (Courtesy of Drs. A. P. Biddle and R. A. C. Wollenberg.)

Treatment.—The lesions should be thoroughly cleansed each day with boric acid or lysol (1 per cent) solution, and a moist antiseptic dressing applied. They usually heal promptly and without incident.

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EPIDERMIDOLYSIS BULLOSA.

Synonyms.—Epidermolysis bullosa; Epidermolysis bullosa hereditaria; Acantholysis bullosa.

Definition.—A peculiar condition of the skin, usually hereditary, which is characterized by the development of vesicles and bullae on even slight traumatic provocation.

Symptoms.—The disorder is a rare one, and was first described by

Fig. 188.—Epidermidolysis bullosa, showing scarring and partial alopecia.

Fig. 189.—Epidermidolysis bullosa. (Courtesy of Dr. T. W. Allworthy.)

Goldscheider, in 1882. In the vast majority of instances the presence of the condition is first noted in early infancy, although occasionally it does not develop, or at least become apparent, until later in life (as in Ormsby's and Wise's cases). The lesions consist of vesicles and bullae of various sizes which develop as a result of even slight pressure or irritation. They are usually filled with serum, but may contain blood. The susceptibility varies considerably in different individuals. The lesions give rise to little or no pain or itching and gen-

erally leave no trace when they disappear, but on parts of the body which are constantly exposed to trauma, as the tips of the fingers, scarring and even atrophy and nail loss may result. As a rule the disorder is markedly hereditary, and its occurrence can occasionally be traced through several generations. Hallopeau has endeavored to

Fig. 190.—Epidermidolysis bullosa.

Fig. 191.—Epidermidolysis bullosa. Section from apparently normal skin stained for elastic tissue. The absence of fibers in the papillary region is shown.

establish the identity of a distinct subvariety of the condition which he designates as "congenital bullous dermatitis with epidermic cysts," but inasmuch as epidermic cysts of the type described by him have frequently been noted as occurring in pemphigus and in other bullous

disorders, and the remaining distinguishing characteristics are occasionally seen in ordinary examples of epidermidolysis bullosa, his suggestion has not met with general acceptance.

Etiology and Pathology.—The cause of epidermidolysis bullosa is

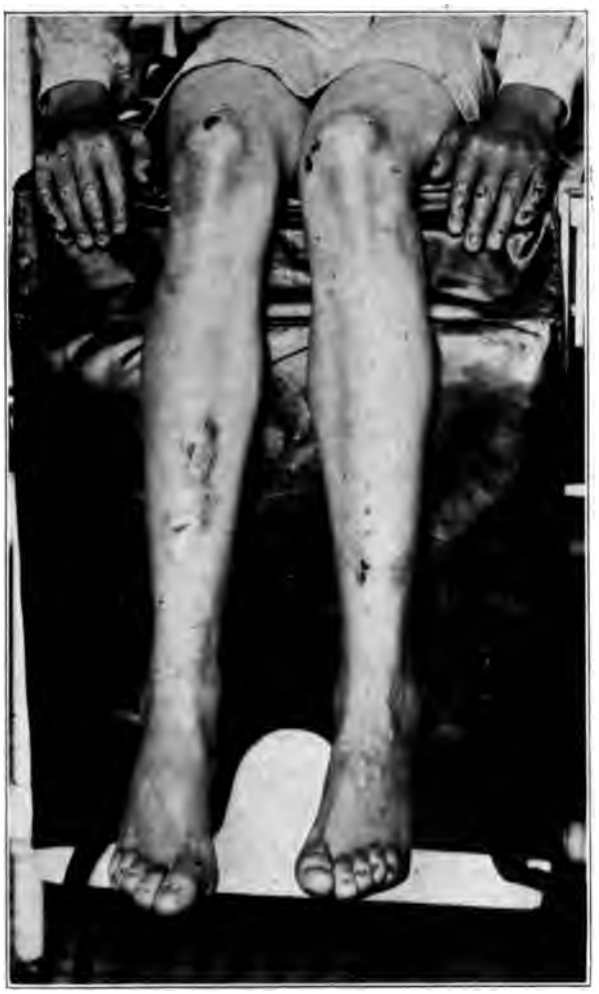

Fig. 192.—Epidermidolysis bullosa in a boy. (Courtesy of Dr. Ralph M. Hissem.)

not definitely known, but it is probable that the condition is due to congenital malformation or acquired changes in the elastic tissues of the upper derma. As Pusey has suggested, "the prolongation of the terminal fibers of this tissue between the cells of

Fig. 193.—Epidermidolysis bullosa. Acquired case. Showing serous and hemorrhagic bullae, epidermic cysts, and cicatrices. (Courtesy of Dr. Fred Wise.)

Fig. 194.—Epidermidolysis bullosa, showing lesions on hands, and characteristic nail changes. (Courtesy of Dr. Ralph M. Hissem.)

the basal layer probably constitutes an important factor in binding the epidermis to the corium." Engman and Mook were the first to discover and call attention to the absence of these fibers in the papillary layer of the uninjured as well as the injured skin of individuals suffering from epidermidolysis bullosa, and in a case which came under my observation in 1910, I was able to confirm the results of their investigations. Weiss also has found similar alterations. The bullous covering normally includes all, or practically all, of the rete. The lesions contain serum, leucocytes, degenerated prickle cells, and, occasionally, red blood cells.

Prognosis and Treatment.—The disorder never gives rise to systemic disturbance, but is wholly uninfluenced by treatment.

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DERMATITIS REPENS.

Definition.—An inflammatory disease of the skin, usually following injuries and characterized by serous undermining of the upper layers of the epidermis with the formation of numerous minute abscesses in the subjacent rete.

Symptoms.—The malady was first described by Crocker in 1888. It usually, but not invariably, follows an injury, and at one time was supposed to be a rare disorder. In point of fact, the affection is a comparatively common one, particularly in adults who lead an active, outdoor life, and who are more or less constantly exposed to slight abrasions and injuries of the integument. It begins as a localized redness of the skin, with accompanying vesiculation or pustulation. If the disease commences at the margin of a fresh wound, there may be only redness and serous exudation at first, with no vesicle or bulla formation. In the course of a few days the diseased area presents a striking and characteristic clinical picture. The central portion consists of a patch of raw or glazed-looking, denuded rete, and is surrounded by a ragged, irregular border of slightly elevated, serously undermined, horny epidermis. Serum and pus can be squeezed from beneath this marginal collar, which varies from 0.1 to 1.0 cm. in width. As the disease progresses, the central portion gradually

develops a new corneous covering, and the earlier denuded areas may be entirely healed long before peripheral extension ceases. In one of Crocker's earlier cases the disease began on the wrist and spread down the hand and up the arm. Ultimately it reached the shoulder and, despite treatment, extended across the back and down the other arm to the elbow. So extensive a development is very unusual, however. The palmar and plantar margins are favorite sites of attack. The disease gives rise to no constitutional symptoms. There is practically no pain, and very little itching. The majority of the patients

Fig. 195.—Dermatitis repens, of a very mild type.

are apparently in good general health. As a rule the disease travels quite slowly, the margin seldom extending further than 0.2 to 0.5 cm. during the twenty-four hours. In some instances the denuded area may become eczematous instead of returning to normal, or an infectious eczematoid dermatitis may develop to complicate the original disorder. Under the name of "acroderatite continué" *(acrodermatitis perstans)* Hallopeau has described a very similar disorder in which the lesions appear to occupy a position about midway between those of dermatitis repens and infectious eczematoid dermatitis. If it were not for the fact that Hallopeau's disease is much more chronic in character than either of these maladies, one might easily suspect

it of being a combination of the two. It is possible that in an individual whose resistance to staphylococci is constantly very low, a clinical picture such as that presented in acrodermatitis perstans might result from infection with strains of this organism which, in other persons, might give rise to an attack of either dermatitis repens or infectious eczematoid dermatitis.

Etiology.—Crocker believes that the dermatitis starts as a result of

Fig. 196.—Dermatitis repens.

peripheral neuritis, generally set up by an injury, and that secondary parasitic invasion tends to produce extension of the disease. Hallopeau regards both dermatitis repens and acrodermatitis perstans as entirely of microbic origin, and the staphylococcus albus has been isolated from many of his cases. In the original cases reported by me, the staphylococcus aureus was found, and since that time it has been repeatedly recovered from all, or nearly all, of the dozen or more examples of the disease that have come under my care.

Pathology.—The destructive process is confined to the upper layers of the rete. The stratum corneum is thickened. The stratum lucidum is sharply outlined, and in many instances thicker than normal. In the affected area, this layer is torn loose from the underlying cells,

Fig. 197.—Dermatitis repens, showing characteristic lesions on foot.

Fig. 198.—Dermatitis repens.

and pushed upward, like the hinged lid of an opened box. The free margin is frayed and broken. The granular layer is the seat of numerous vesicles, some of which break through the thin walls of the overlying cells and allow the contents to escape on the surface. The

cells surrounding these cavities are irregularly arranged and the innermost show fragmented nuclei and other degenerative changes. The prickle layer is somewhat thickened, and the constituent elements are swollen and edematous. A few "balloon" forms are present, and many of the more superficial cells contain bacteria. The cells of the

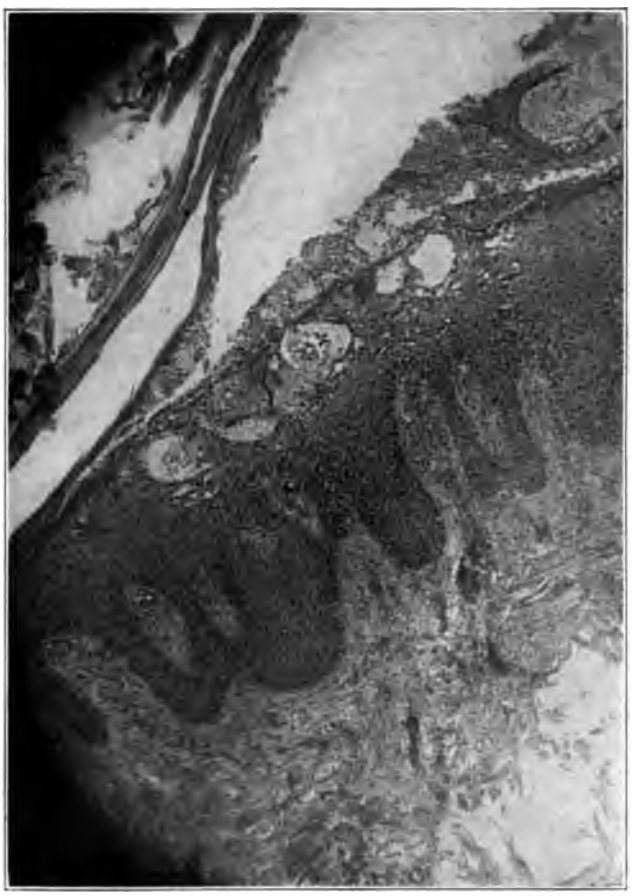

Fig. 199.—Dermatitis repens, showing abscess in prickle layer, just beneath stratum lucidum. Entire depth of corneous layer is not shown. Low magnification.

mucous layer are swollen, but are normal in number and arrangement. The papillae are increased in size, and numerous leucocytes are to be found in the neighborhood of the capillaries. No mast cells are seen. There are some inflammatory changes in the subpapillary region but they are not pronounced either in degree or extent. The elastic tissue is unaffected.

Diagnosis.—The appearance of the lesions is so distinctive that it is hardly possible to confuse them with those of any other disorder. In infectious eczematoid dermatitis the eruption is usually of wide distribution, the patches are superficial, and even if crusted, lack the thick, undermined margins and bright, raw central areas of those seen in dermatitis repens.

Prognosis.—The disease is extremely rebellious, and it may persist for months, or even years.

Treatment.—Before treatment is instituted plentiful amounts of material should be removed for bacteriologic study and for the making of autogenous vaccine. After the latter is prepared, it should be given in large doses, from 500,000,000 to 1,000,000,000 per injection, twice weekly. Of the various local applications, Ruggles' mixture (salicylic acid 1 part, tannic acid 5 parts, and alcohol 50 parts) has proved the most serviceable in my hands. The epidermal fringe should be clipped off, and the undermined edge carefully loosened before the remedy is applied. It should be painted on thoroughly, once daily. Crocker recommends an aqueous solution of potassium permanganate (10 per cent), to be applied once daily for one week. The crust which forms is then allowed time to loosen, when it is removed, and the painting repeated. Stelwagon strongly recommends a saturated aqueous solution of boric acid to which resorcin (1 per cent) has been added. Hartzell advises formalin (12 per cent) in glycerine, and Hallopeau, applications of a solution of silver nitrate (12 per cent) in nitrous ether.

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IMPETIGO CONTAGIOSA.

Synonyms.—Impetigo vulgaris; Impetigo simplex; Impetigo staphylogenes.

Definition.—An acute, infectious disease of the skin, characterized by the occurrence of discrete, thin-walled vesicles and bullae which quickly become pustular, and soon dry and form yellowish, loosely adherent crusts.

Symptoms.—There are several clinical varieties of the disease, and the lesions vary considerably in size, shape and distribution, but the

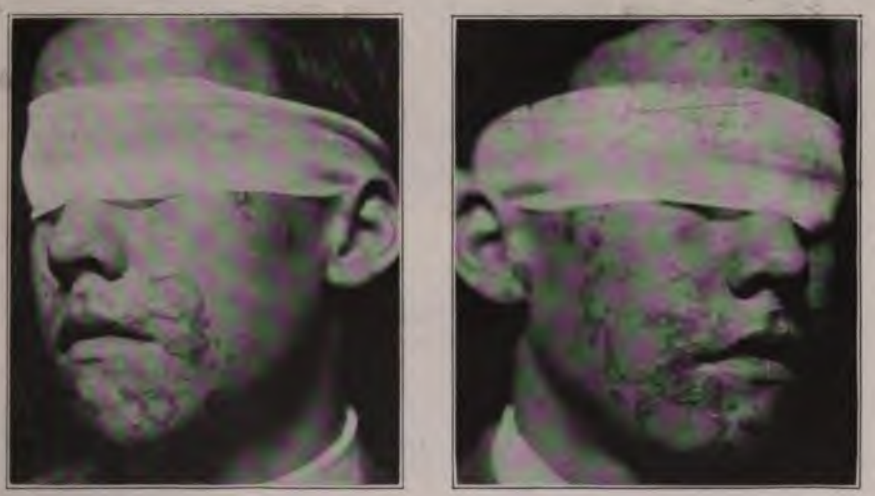
essential features are the same in all. The face is the site of predilection, although the neck, hands and other parts of the body are occasionally attacked. The lesions begin as localized erythematous areas, upon which the individual vesicles rapidly develop, usually in the course of a few hours. The vesicles and bullae quickly become pustular, often before they are fully matured. The lesions usually dry up almost as rapidly as they have developed. The resulting crusts are thin, honey-colored, and loosely attached, and soon drop off, leaving faint hyperemic areas which gradually fade and disappear. The lesions may appear singly or in crops, and the number present at any one time varies from four or five to a score or more. Coalescence is rather

Fig. 200.—Impetigo contagiosa in a little girl.

Fig. 201.—Impetigo contagiosa.

unusual, but may occur. There is never any resultant scarring. Itching is slight or absent. The mucous membranes are sometimes attacked, as Montgomery and others have shown. Children are much more susceptible to the disease than adults. Specific designations are sometimes employed in referring to the various clinical varieties. Thus one type, which develops slowly, with the formation of bullae of unusually large size, is spoken of as "*impetigo serosa.*" Another form, presenting annular, serpiginous, or segmental lesions, is designated as "*impetigo circinata.*" The majority of cases of so-called acute pemphigus of infants *(Pemphigus neonatorum)* are very prob-

Fig. 202.—Impetigo contagiosa.



A. *B.*

Fig. 203.—Circinate impetigo contagiosa.

Fig. 204.—Impetigo annularis in a negress. (Courtesy of Dr. Lloyd W. Ketron.)

Fig. 205.—Impetigo contagiosa of unusual configuration. (Courtesy of Dr. L. W. Ketron.)

ably examples of bullous impetigo contagiosa. Bockhart's impetigo is really a superficial staphylococcic folliculitis, and is pustular from the outset. Impetigo contagiosa is a not unusual complication of

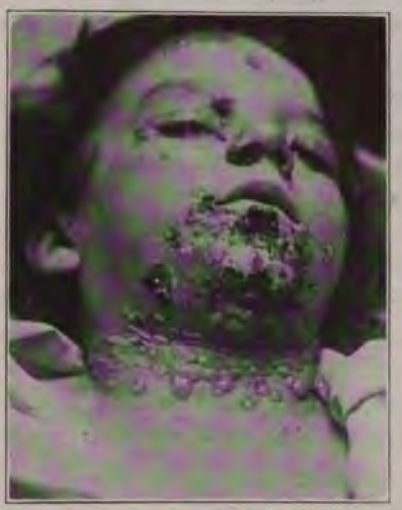


Fig. 206.—Impetigo contagiosa of an unusually severe type. (Courtesy of Dr. L. W. Ketron.)

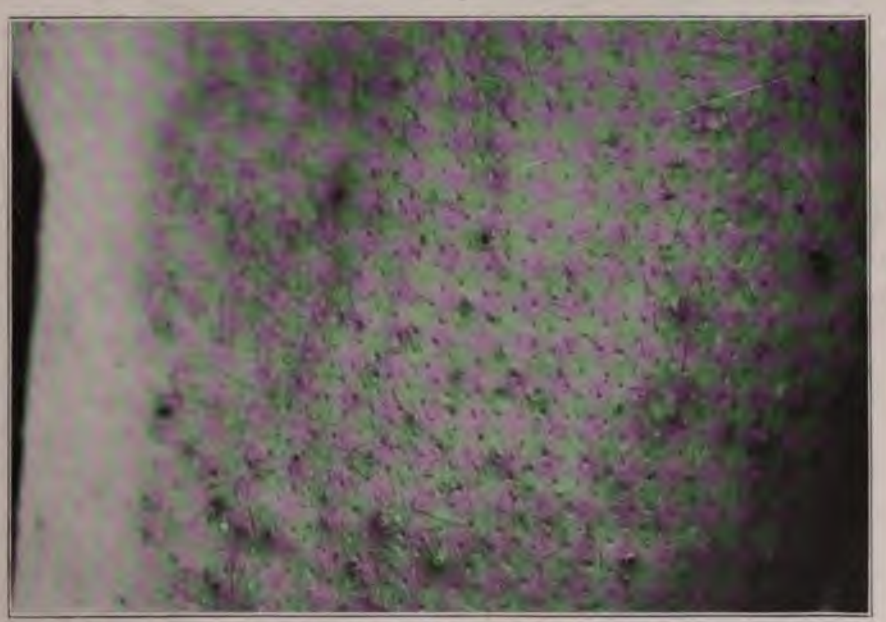


Fig. 207.—Impetigo follicularis. (Bockhart.)

pediculosis capitis, just as infectious eczematoid dermatitis and scabies often coexist in the same individual. Steill has reported five cases of acute nephritis, resulting from impetigo contagiosa. He suggests that many of the cases of so-called "trench-nephritis" in soldiers are, in fact, a complication of impetiginous pediculosis, or scabies.

Etiology.—Both staphylococci and streptococci have been recovered from the lesions. Sabouraud believes that the disease is due to a streptococcus. Engman obtained pure cultures of the yellow staphylococcus from fresh vesicles, and succeeded in producing typical lesions by reinoculation. It is probable that this organism is the etiologic factor in some cases of the disorder, and the streptococcus in others.

Pathology.—There are slight inflammatory changes in the papillary layer. The rete is edematous and somewhat thickened. The roof of the lesion is formed by the stratum corneum, and the floor by the upper layers of the rete. The cavity is filled with serum, in which are found degenerated epithelial cells, leucocytes, a few lymphocytes, and considerable numbers of cocci of various kinds.

Diagnosis.—The disorder may be confused with vesicular eczema, pemphigus, and infectious eczematoid dermatitis. In vesicular eczema the lesions are small, closely grouped, infiltrated, itchy, and persistent. In pemphigus the eruption is rarely if ever confined to the face, the bullae develop as such, the lesions are not autoinoculable, and the vast majority of the patients are adults.

Prognosis.—If neglected, or improperly treated, the disease may prove persistent and distressing.

Treatment.—All crusts should first be soaked off with warm, soapy water to which borax or sodium carbonate has previously been added. The affected areas are then liberally anointed with a 1 percent. ammoniated mercurial ointment. The antiseptic should be reapplied several times daily. If there is much itching, carbolic acid (1 per cent) may be added to the preparation. As Walker has stated, the application of too strong an ointment is one of the mistakes often made in the treatment of this disorder. It is probable that the more powerful antiseptics act as irritants, and, by causing a free discharge of serum, promote rather than inhibit bacterial growth. In those cases presenting raw surfaces of considerable extent, I have found a powder consisting of calomel (1 part) and boric acid (16 parts) a valuable supplementary agent. Morrow strongly recommends the use of a 20 per cent aqueous solution of silver nitrate. As a prophylactic measure, the entire surface should be sponged with alcohol twice daily.

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PEMPHIGUS NEONATORUM.—*Biddle*, Jour. Cutan. Dis., 1914, p. 268 (a valuable paper). — *Falls*, Jour. A. M. A., 1916, lxvii, p. 1522; Idem, Am. Jour. Obst., 1916, 74, p. 1048. — *Steill*, Practitioner, London, 1918, C., No. 4, p. 368.

ECTHYMA.

Definition.—An acute inflammatory disease, characterized by the formation of one or more discrete, flat, pea- to finger-nail-sized pustules, which may be followed by slight scarring or temporary pigmentation.

Symptoms.—Both children and adults are attacked. The legs and thighs are the sites of predilection, although no region is exempt. The lesions, which vary in number from one to a dozen or more, are

Fig. 208.—Ecthyma.

usually circular or irregularly oval in outline and sharply defined, with pinkish or reddish areolae. They begin as small, yellowish pustules, which enlarge by peripheral extension. In the course of ten days or a fortnight they begin to desiccate, and soon dry up, forming thick, adherent, brownish crusts. The bases are excoriated and raw, and at times quite sensitive to pressure. There is considerable induration. The crusts drop off in the course of a few weeks, although the disease may be continued indefinitely by the development of new lesions. In the milder type of the affection *(ecthyma simplex)* there is usually some resultant temporary brownish pigmentation, but no scarring. In the more severe and deeply seated variety *(ecthyma gangrænosum)*, however, scarring is the rule rather than the exception. The lesions give rise to itching and burning at times, and there may be some accompanying systemic disturbance. Slight lymph-

node involvement is not unusual. The mucous membranes are seldom, if ever, involved.

Etiology.—A state of lowered resistance to the common pyogenic organisms, particularly the staphylococcus aureus, is probably the most important predisposing factor. Uncleanliness, poor hygienic surroundings, and general debility also occasionally play important parts in this preparatory process. The direct causative agent is probably the yellow staphylococcus. The disease is slightly infectious, and readily autoinoculable (Widal).

Pathology.—The lesions are epidermal abscesses which originate in the upper regions of the prickle layer. The subjacent papillae are swollen and infiltrated. "The intrapapillary vessels in the red marginal zone are dilated, but nearer the center the capillary hyperemia diminishes, and the edema distinctly increases, so that the pustule is directly surrounded by a wall of extraordinarily broad and much swollen papillae, between which the epithelial ridge net is reduced to minute depressions" (Unna).

Diagnosis.—Ecthyma may be confused with the flat pustular syphiloderm. In syphilis the lesions are usually more numerous and of wider distribution, the edges of the subjacent ulcerations are abrupt and sharply defined, there is little or no pain, and the crusts are bulky and greenish in color. Other signs of syphilis are usually apparent. In doubtful cases, resort may be had to a Wassermann test.

Prognosis.—The prognosis is to a certain extent dependent upon the patient's general condition. As a rule the disease responds favorably and promptly to appropriate treatment.

Treatment.—In the majority of instances tonics are indicated. The food should be simple but nourishing and plentiful in amount. The crusts should be removed by means of starch poultices or similar wet dressings. The lesions should then be cleansed, and a mild, antiseptic application, such as an ointment containing ammoniated mercury (2 per cent), freely applied. If the ulcers prove sluggish, an occasional painting with an aqueous solution of silver nitrate (10 per cent), is beneficial, or resort may be had to applications of balsam of Peru, or compound tincture of benzoin.

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Some of the spots disappear while others become slowly larger, raised, hard and infiltrated, without showing signs of vesication or pustulation, and very often, especially on the feet, somewhat cupoliform; they reach the size of a pea to that of a small cherry; there is no pustulation. After a time the center of the nodule breaks down and an ulcer forms with reddish fundus and often undermined edges. These ulcerative lesions are somewhat painful and extremely slow to heal, complete spontaneous cure seldom taking place in less than ten to twelve months; on healing, patches of hyperpigmentation often remain. The condition is fairly common in young, strongly built European planters. If agar tubes are inoculated a streptococcus-like germ grows in pure culture from the non-ulcerated lesions, while from the ulcerated lesions staphylococci and other germs may be grown, in addition to the streptococcus. This streptococcus is biologically different from all other streptococci Castellani has so far isolated in Ceylon from skin affections and systemic diseases of streptococcus origin. He named it *Streptococcus tropicalis* (1914). It is Gram-positive, does not liquefy gelatine and does not produce indol."

FURUNCULUS.

Synonyms.—Boil; Furuncle.

Definition.—An acute, deep-seated, circumscribed, phlegmonous inflammation, usually resulting in suppuration and necrosis.

Symptoms.—As a rule the inflammatory process begins in the immediate vicinity of a skin gland or hair follicle. The formations vary in number from one or two to several score, and an attack may be prolonged almost indefinitely by the development of new lesions. The neck, the axillae, face, buttocks and legs are the sites of predilection, although no region is exempt. The individual lesions begin as subcutaneous swellings or as acuminate pustules surrounding the shaft of a large or lanugo hair. As the lesions develop the involved skin becomes smooth, tense, and shiny. Pain and tenderness are present from the beginning. In the course of a few days the tumor usually matures, and either comes to a "head," or becomes boggy and fluctuant. In a certain percentage of cases, however, regression takes place before the occurrence of suppuration, and the lesion, which is known as a "blind boil," slowly disappears by absorption. On reaching maturity boils generally rupture spontaneously, and the necrosed masses of tissue, or "cores," forming their centers are discharged, together with variable amounts of pus and serum. Following this healing speedily ensues. In some of the follicular cases the central portions of the lesions undergo necrosis, but instead of assuming a soft, pultaceous aspect, they become tough, stringy and tenacious. In this variety the tumors are of relatively small size, extremely painful, and less responsive to treatment than those of the ordinary type.

Etiology.—Certain predisposing factors, which tend to lessen the patient's resistance to microbic invasion, are generally recognized. Of these, diabetes mellitus and nephritis are the two more important. In every case of furunculosis the patient's urine should be carefully examined. Sewer gas poisoning is a potent factor in some instances (Crocker). Traumatic lesions of the skin, irritation from the handling of tar and

paraffin products, and excessive sweating, all are important supplementary factors at times. Duke has pointed out the influence of coexistent focal infections in cases of chronic furunculosis. My experience coincides with his. In obstinate cases, careful search should always be made for suppurative foci in the tonsils and teeth. Boils are inoculable and autoinoculable. The direct exciting agent is undoubtedly a microorganism, very probably the yellow staphylococcus.

Pathology.—The inflammatory process always involves a skin gland or a hair follicle. The central slough is composed of pus, fibrin, and necrosed glandular and periglandular tissue. The changes in the derma are those which always accompany acute inflammatory processes in that region.

Diagnosis.—The disorder might be confused with carbuncle. The differential diagnosis is given under that disease.

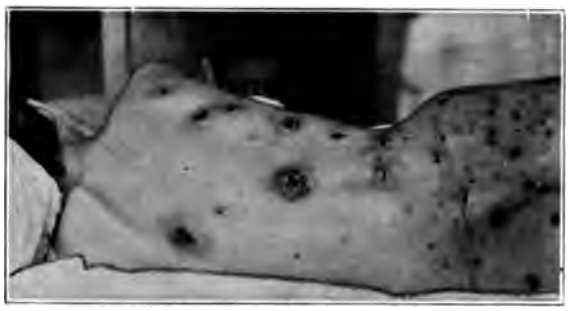

Fig. 209.—Furunculosis in typhoid fever. (Courtesy of Dr. G. B. Lemmon.)

Prognosis.—The outlook is largely dependent upon the presence or absence of any serious underlying factor. In the majority of instances the disease responds favorably to treatment, although recurrences are not uncommon.

Treatment.—The line of internal treatment to be adopted is dependent upon the general condition of the patient. In many instances tonics are indicated, but in certain types of cases occurring in plethoric individuals it is advisable to restrict the diet, and place the patient on diuretics and saline laxatives. Needless to say, any associated renal disorder should receive appropriate treatment. Vaccine therapy gives more satisfactory results in furunculosis than in any other disease, but if the maximum degree of benefit is to be derived, the preparation should be a reliable autogenous one and large doses should be given. I generally advise an initial dose of 500,000,000 in adults, with a gradual increase up to 1,000,000,000. The injections are best given subcutaneous-

ly, at intervals of four days. The only other internal remedy that I have ever found directly helpful in combating this disorder is sodium citrate, as recommended by Skillern. When administered in plentiful amounts it tends to hasten necrosis and liquefaction, and is particularly valuable in combating the indolent type of lesions. Locally, mild antiseptics, applied in the form of moist dressings, should be employed. If too powerful they are liable to give rise to irritation, and thus tend to increase the patient's susceptibility to attack. A good plan is to paint the tips of the lesions once daily with tincture of iodine, and then apply a large gauze pack, moistened with an aqueous solution of lysol (1 per cent). If there is much pain, the dressing can be heated by means of an ordinary electric pad. Poultices composed of linseed, bread and milk, and similar substances should never be used. They are insanitary, and instead of hastening recovery often serve to prolong the attack. In my opinion it is exceedingly doubtful if early incision of the lesions, followed by the use of carbolic acid, formalin and similar antiseptics, ever hastens recovery. If a boil can be aborted by the early local application of mercurial plaster, or of tincture of iodine, well and good, otherwise the most satisfactory plan is to hasten its maturity by the aid of hot, moist, antiseptic dressings, and incise only when nature has walled off the lesion, and the central slough has separated and is ready to be discharged. As a precautionary measure, absolute cleanliness is essential. Ochsner speaks highly of electric light as a curative agent in furunculosis. I have found both the Alpine Sun lamp and large incandescent lamps (500 C. P.) of value in combating the condition, especially in the earlier stages.

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CARBUNCULUS.

Synonyms.—Carbuncle; Anthrax simplex.

Definition.—An acute, circumscribed inflammation of the skin and subcutaneous tissue, with ensuing suppuration and sloughing, and the discharge of necrosed material through multiple openings in the summit of the lesion.

Symptoms.—In many respects, carbuncles resemble furuncles. They are usually larger, however, are always accompanied by more or less systemic disturbance, and usually, when central necrosis occurs, their

contents are discharged through several or more openings in the overlying epidermis. The lesions are commonly single. The first appreciable signs are those of a painful, localized, subcutaneous induration which gradually increases in size until it has attained the diameter of a small hen's egg. The overlying skin is dark red in color, tense and shiny. Suppuration occurs in the course of a week to a fortnight, but instead of a single, central slough, as in furunculus, the tumor drains through a number of openings, and the purplish, oval summit presents a peculiar fenestrated or cribriform appearance which is both striking and characteristic. The central portion of the lesion may undergo necrosis at several different points at the same time and a number of small sloughs form and be cast off, or the entire mass may be involved at once, with resulting formation of a deep, ragged ulcer, several centimeters in diameter. This cavity fills up with granulation tissue, and ultimately heals, with more or less scarring. Constitutional symptoms are invariably present, and may be quite severe. The sites of predilection are the neck, shoulders, buttocks, and outer surfaces of the thighs.

Etiology.—The exciting organism in many instances is undoubtedly the staphylococcus pyogenes aureus. The predisposing factors are very similar to those found in furunculus. In fact the two disorders not uncommonly co-exist. The disease occurs more often in men than in women, and adults are attacked more frequently than children. Diabetics are especially susceptible. Constitutional symptoms are invariably present, and may be quite severe.

Pathology.—The infection is a deep-seated one, and the inflammatory process usually starts at some point in the subcutaneous tissue. The resulting pus may drain through one or more channels along the course of a hair follicle or a skin gland, but the overhead pressure is oftentimes too great for it to escape upward and in consequence the fluid spreads laterally, between and beneath the layers of fibrous tissue, until an overlying area of lowered resistance is encountered, usually in the neighborhood of an adipose column, when it escapes to the surface.

Diagnosis.—Carbuncles differ from furuncles solely in the location of the initial seat of the disease process, and the density and resisting power of the overlying tissue. In consequence, the carbuncle is larger, flatter, more painful and develops less rapidly, opens by many rather than by one or two apertures, and is followed by larger sloughs (Hyde).

Prognosis.—The outlook is largely dependent upon the age and

general condition of the patient. In young and vigorous persons recovery generally ensues in the course of a few weeks. In lesions involving the scalp, however, death has occurred as a result of thrombosis or embolism, and in elderly and debilitated individuals, a fatal ending through exhaustion or sepsis is not uncommon.

Treatment.—The patient's general health should be investigated. The bowels and kidneys should be kept active. A supportive line of treatment is usually advisable. The use of a reliable autogenous vaccine sometimes hastens recovery. It is doubtful if we have at our command an internal remedy which exerts any influence upon the course of the disease. Calcium sulphide and similar preparations have proved worthless in my hands. In the earlier stages of the disease crucial incisions were formerly recommended, but this method of treatment has gradually and deservedly fallen into disrepute. Injections of carbolic acid and similar substances, as originally suggested by Woods and others, may do good by giving rise to superficial sloughing which lowers the resistance of the tissue and thus hastens the "centering" of the lesions. The bactericidal effect exerted, however, is probably nil. I have found the employment of hot, moist, antiseptic dressings (lysol, 1 per cent) the most satisfactory plan, followed by incision as soon as the tumor is fluctuant. An occasional application of tincture of iodine often proves helpful, both before and after the lesion is incised. Many surgeons advocate the complete and early excision of the infected mass, but in the majority of instances I believe this too radical a step.

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EQUINIA.

Synonyms.—Glanders; Farcy.

Definition.—An acute, infectious disease of the skin, due to the bacillus mallei, and characterized by the occurrence of vesicular, pustular, and ulcerative lesions, with associated systemic symptoms of variable degree.

Symptoms.—Equinia or glanders, is a comparatively common disorder of horses, mules and donkeys, but it is fortunately a rare disease in man. It may be conveyed directly, or through the agency of contaminated articles such as towels and brushes. Infection may take place through any breach of continuity of the skin or mucous mem-

branes, and probably occurs most frequently through the respiratory tract. Clinically, the disease may be acute or chronic. The period of incubation is subject to considerable variation. The earlier symptoms are those of a mild septicemia—malaise, vague joint pains, fever of an intermittent type, and prostration. A profuse catarrhal or purulent nasal discharge is frequently present, particularly in the acute cases, and constitutes one of the most characteristic features of the disorder. In the acute form the manifestations of systemic involvement gradually become more marked, and the patient sinks into a typhoidal state, and generally dies. The cutaneous symptoms are somewhat varied. In those cases in which infection has occurred by this route, the initial lesion may be carbuncular, papular or vesicular. More or less induration is present, however, in any event, and superficial sloughing is a very common sequel. The characteristic skin lesions develop in the course of from one to four weeks, as groups of small, deep-seated, reddish or yellowish papules which sometimes become vesicular or bullous, but invariably break down sooner or later, and form ulcers of various shapes and sizes. These may coalesce, giving rise to large, gangrenous patches. There is usually associated involvement of the lymphnodes. They may result in the formation of subcutaneous nodules which are known by veterinarians as "farcy buds." These tumors often break down and ulcerate through the overlying skin, giving rise to foul, suppurating ulcers. In the chronic form the lesions are fewer in number, and less serious in character. The catarrhal symptoms develop late, if at all. The disease may persist for months or years.

Etiology.—Equinia is due to infection with the bacillus mallei. The vast majority of the cases reported have occurred in adult males whose occupations have brought them in close contact with horses. Several instances of conveyance from man to man have been noted, however, and every precaution should be taken to protect associates of the patient.

Diagnosis.—The involvement of the nasal mucosa is the most characteristic feature of the malady. This, together with the skin and lymphatic involvement and the usual peculiar typhoid-like nature of the constitutional symptoms, should prevent confusion. Microscopic examination of the discharge usually furnishes conclusive evidence, and animal inoculations may be resorted to, if necessary.

Prognosis.—Practically all of the acute cases terminate fatally, and a large percentage of the chronic cases end in death. In the chronic form, symptoms of the acute type may supervene, even after the apparent recovery of the patient.

Treatment.—Mallein, a preparation which in many respects corresponds to antitoxin, has been tried with some degree of success by Bonome and others. In addition, the usual surgical measures are to be employed.

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NECROBACILLOSIS OF THE SKIN.

In 1910, Stemen and Shaw described an acute infectious disease of the skin in man due to the bacillus necrophorus of Dammann. Their patient was a government meat inspector, and the lesions, which were bullous in character, developed at the site of a small scratch wound on the dorsum of the left hand. The entire hand and arm were swollen and edematous, with attendant fever and prostration. The constitutional symptoms persisted for about one week, when the patient recovered.

Shaw secured pure cultures of Dammann's bacillus from several of the bullæ.

The treatment is supportive, with free drainage of the affected area, and the application of moist antiseptic packs.

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PUSTULA MALIGNA.

Synonym.—Anthrax maligna.

Definition.—Malignant pustule is a circumscribed, inflammatory, carbuncular disorder resulting from infection with the bacillus anthracis.

Symptoms.—Anthrax infection in man may be internal or general, or external or localized. Systemic involvement is rare, and will not be considered here. The disorder may be contracted from infected domestic animals or their products (hides, hair, etc.), or even through intermediate sources, such as the bites of fleas, flies, and other insects. The period of incubation varies from one to three days. At the end of that time a minute, pruritic, reddish macule resembling a flea bite develops, to be followed in the course of twelve to twenty-four hours by a red, indurated papule, which speedily becomes vesicular or pustular. The lesions may spread and coalesce until large areas are involved. The lesions often contain blood or an admixture of blood and pus, and soon

rupture, leaving a dark red base which dries up and becomes gangrenous and black in the course of a few days. The disease may then proceed to recovery, or several or more satellite vesicles may develop until a palm-

Fig. 210.—Anthrax in man. The primary lesion developed on dorsal surface of left hand ten days earlier. Organism found. Recovery under expectant plan of treatment.

sized area is involved. The affected skin is livid, brawny and indurated, and extensive sloughing may occur. The associated lymphnodes are pal-

Fig. 211.—Anthrax. Infection from shaving brush.

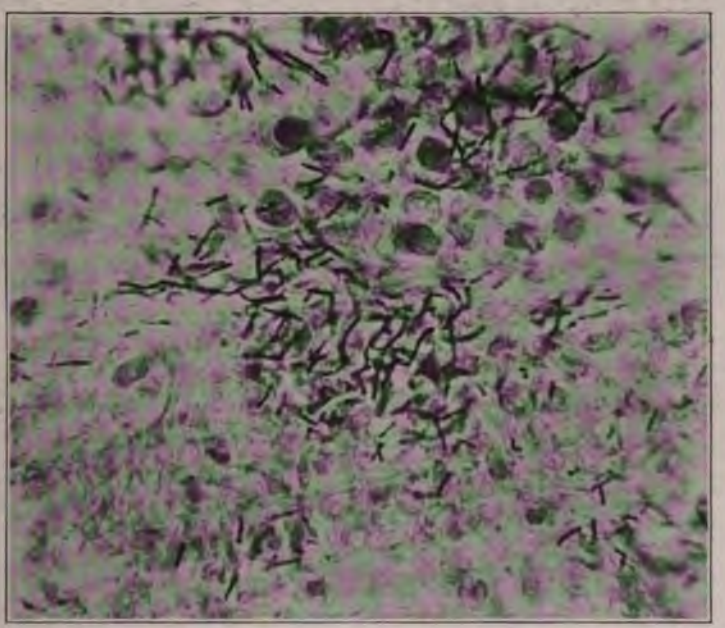

Fig. 212.—Anthrax, showing bacilli in tissue. (Courtesy of Dr. Arthur St. Clair Brumbaugh.)

pable and tender. General infection follows the localized type in some instances, always with serious, and frequently with fatal, results.

During the past three years, a number of cases of anthrax in man have been reported from the various army camps in this country and in Great Britain. In a considerable percentage of the cases, the disease had been conveyed by infected shaving brushes. I have encountered two typical examples of the disease in which the infection could clearly be traced to this source.

Etiology.—The disease is due to infection with the bacillus anthracis. The majority of the reported cases have occurred in adult males.

According to Prosser White, the infection is usually conveyed by the agency of dust in the work, and persons engaged in handling hides and skins are the most frequent victims of the disease.

Treatment.—While the older text-books advocate early and radical excision of the lesions, expectant treatment, by means of antiseptics locally and sera internally, undoubtedly gives the best results. In this country, antianthrax serum can be obtained from the Bureau of Animal Industry, at Washington, D. C., and in well developed cases of the disease I believe that it should always be administered. Locally, I have found lysol (1 per cent aqueous solution) valuable. Lienhardt, who saw almost a score of cases at Camp Merritt, speaks highly of the use of the actual cautery locally, and antianthrax serum (100 to 200 c.c.) intravenously. Needless to say, the resistance of the patient should be strengthened in every possible manner. Eurich recommends Sclavo's antianthrax serum. Buberl, Becker, Schuster, and others have found arsphenamine helpful. Of the various local antiseptics, phenol, powdered ipecac, and mercuric chloride have been recommended. Ferry recommends desiccated anthrax antigen for immunization purposes in the case of animals, but it is doubtful whether the method would prove practicable in man.

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ERYSIPELAS.

Synonym.—St. Anthony's fire.

Definition.—An acute, localized inflammation of the skin and subcutaneous tissue, due to a specific micro-organism, and characterized by redness, edema and induration, and accompanied by systemic disturbance of variable degree.

Symptoms.—The cutaneous manifestations are generally preceded by symptoms of slight constitutional disturbance and feelings of malaise and chilliness, followed by fever. The eruption begins as a minute erythematous patch which gradually enlarges, the involved skin becoming swollen and elevated, and pinkish or reddish in color, with a shining, glazed surface upon which vesicles and bullae occasionally develop. The margins of the patch are sharply defined from the first, and the lesions usually spread gradually by peripheral extension. To the touch the affected area is firm, indurated, and considerably warmer than the adjacent normal skin. There is some burning and itching, but the subjective symptoms are seldom severe in character. The lesions are generally single, and seldom involve very extensive areas. They may give rise to considerable swelling and edema, however, particularly in cases involving the face and ears. The mucous membranes sometimes are attacked. Occasionally a case is seen in which the inflammatory process is confined almost exclusively to the subcutaneous tissue, the edema of the overlying skin being the sole superficial manifestation. An attack generally lasts from one to several weeks, and febrile symptoms are usually present throughout the course of the disease. As the end of a few days or a fortnight the process reaches its acme, then persists unchanged for a time, and finally begins gradually to subside. As involution takes place, the dusky red color slowly fades to a brownish and then a yellowish hue, and ultimately the epidermis regains its normal color. There is always more or less succeeding desquamation. The face is a site of predilection, although no region is exempt. On the limbs the eruption may exhibit a tendency to follow up the lymphatics, in a manner suggestive of an ordinary streptococcic

cellulitis. In some instances the eruption may spread rapidly at one border, the older portion of the patch clearing up as the progressive margin advances (*Erysipelas ambulans*).

Etiology.—The disease is due to the action of a specific streptococcus (Fehleisen). It is possible that other bacteria also may prove causative at times, but bearing in mind the results of Rosenow's recent work on the transmutation of certain organisms, it is not improbable

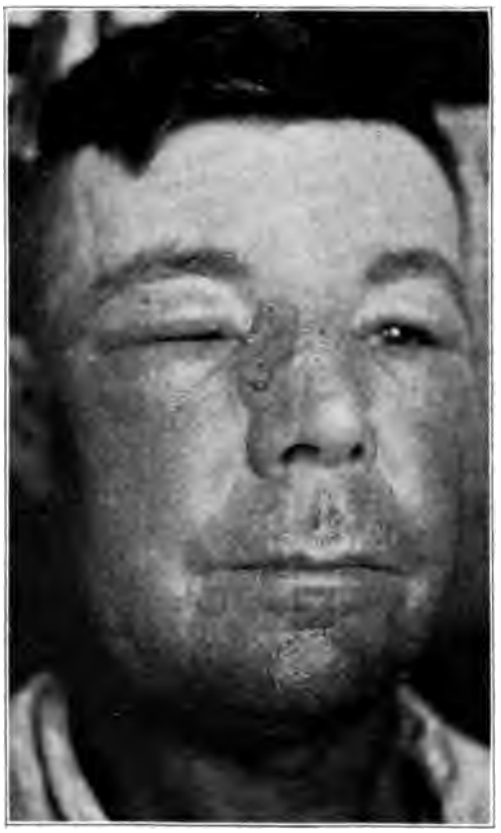

Fig. 213.—Erysipelas of face, showing characteristic edema.

that the other bacteria which have from time to time been recovered from erysipelatous lesions are but aberrant types of Fehleisen's streptococcus.

Pathology.—There is cellulofibrinous exudation throughout the corium, even in the deeper regions. The blood and lymph channels are dilated and congested. There is marked perivascular infiltration

(mainly leucocytes). The prickle cells are swollen, cloudy, and vacuolated. Colliquation necrosis is not unusual. The streptococci are found chiefly in the lymphatics, but are also distributed in the tissues. Vesicles, if present, contain serum and fibrin, leucocytes, degenerated prickle cells and micrococci.

Diagnosis.—Erysipelas is to be distinguished from dermatitis and

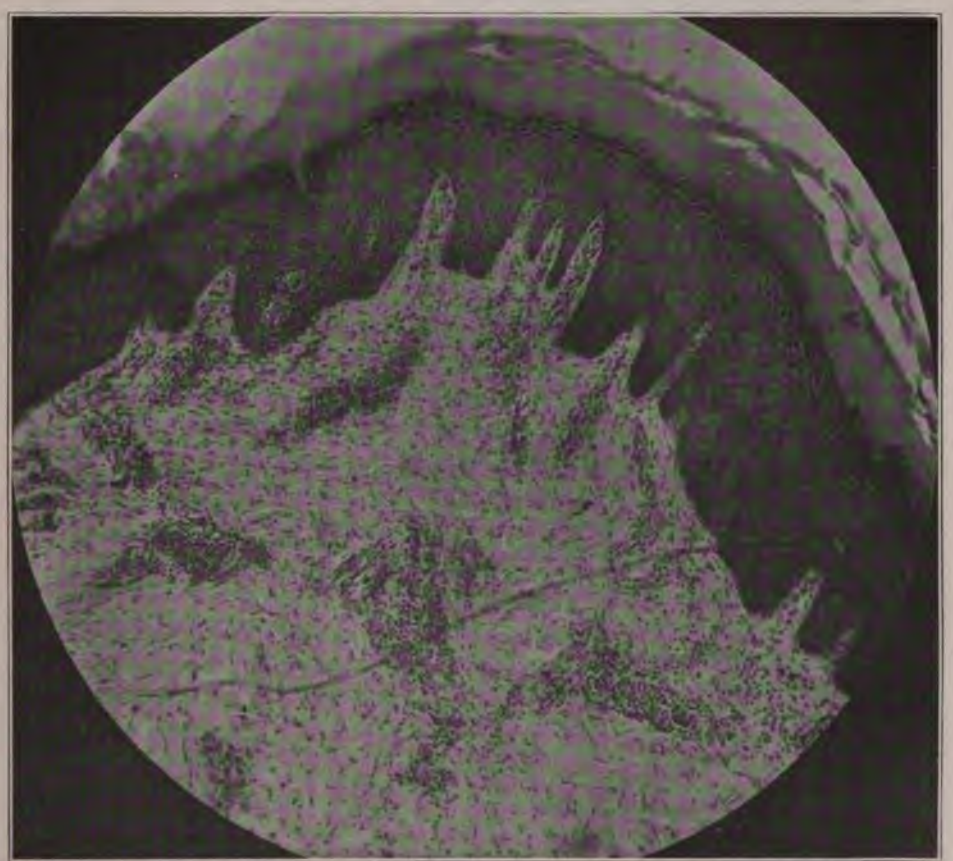

Fig. 214.—Erysipelas, showing location of cellular infiltrate in derma. Moderate magnification.

from acute eczema. The sharply defined, indurated character of the erysipelatous lesions, together with the constitutional disturbance which always accompanies them, is distinctive.

Prognosis.—In the majority of instances the disease is apparently self-limited, and recovery takes place in a few days or weeks, even though treatment be neglected. Cases in which the deeper tissues are

affected, cases involving the scalp, and cases occurring in puerperal women and in confirmed alcoholics are always serious, and may prove fatal.

Treatment.—The constitutional treatment is largely symptomatic. It is exceedingly doubtful if we possess an internal remedy which exerts any direct influence upon the course of the disease. A mercurial purge, followed by a saline, should be administered at the outset. Injections of antistreptococcic serum sometimes prove beneficial, and should always be given a trial in severe cases of the disease. Foreign proteins, such as typhoid vaccine, best administered intravenously, often prove beneficial in intractable cases. Pilocarpine, alone, or with digitalin, is helpful at times (Tyson and Kinsey). Of the multitude of local applications that have been recommended, ichthyol, in ointments or in aqueous solution (10 to 50 per cent), is probably the most popular. Gauze dressings moistened with a saturated aqueous solution of magnesium sulphate, or of sodium hyposulphite, may prove serviceable at times. The value of surrounding the patch with a broad, painted band of silver nitrate solution, tincture of iodine, or carbolic acid, in order to prevent extension, is questionable, for the disease process probably travels through the lymphatics, and the amount of antiseptic that reaches the upper regions of the derma must be exceedingly minute. Possibly some benefit is derived as a result of the irritation and consequent arterial hyperemia which follows the use of such applications. Avata and Woodyatt believe that a thick, half-inch stripe of non-flexible collodion painted one inch in advance of the line of induration will prevent further spread of the disease. In the vesicular and bullous types, the lesions should be incised, drained, and covered with moist antiseptic dressings, or painted with a saturated aqueous solution of pyoktanin blue.

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ERYSIPELOID.

Synonym.—Erythema serpens.

Erysipeloid is an erysipelas-like condition which develops on the hands of butchers, poultry-dressers, fishmongers and others as a result

of some infection derived from putrid flesh and similar substances. In the majority of instances it follows slight traumatic injuries. In the Chesapeake Bay region cases following crab-bites are very common, as Gilchrist has shown. There are no constitutional symptoms, and the lesions, which are bright or dark red in color, painful and itchy, tend to disappear spontaneously in the course of a fortnight or two. It is probable that the infecting agent is transported on the claws of the shell fish from the putrid flesh upon which the crustaceans frequently feed to the wound of the affected individual. Rosenbach has described a micro-organism of the order *Cladothrix* which he has recovered from the lesions and with which he reproduced the disease. His results have not yet been confirmed, however. Gilchrist's cultural and inoculation experiments proved negative. He believes the malady is due to the action of a special ferment. The disease is to be differentiated from erysipelas and dermatitis repens. The employment of moist, antiseptic dressings tends to hasten recovery.

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SPHACELODERMA.

Synonyms.—Gangrene of the skin; Dermatitis gangrænosa.

Definition.—Gangrene of the skin occurs only as a result of vascular disease or injury. In the majority of instances the condition is dependent upon a combination of disorders—a constitutional factor, such as diabetes mellitus or an organic disease of the nervous system, plus local microbic infection. Crocker separates the various possible internal causes into three classes:

1. Within the vessels.
   - Embolism.
   - Thrombosis.
2. Changes in the vessel wall.
   - Acute arteritis of bacterial or syphilitic origin.
   - Calcareous degeneration (as in senile gangrene).
   - Contraction of muscular or other coats.
     - Spasmodic (as in symmetrical gangrene).
     - Chronic (as in ergotism).
   - Trophic defects (as in acute decubitus).
   - Purpuric gangrene from blood extravasation.
3. Pressure on the vessels from without.
   - Inflammatory effusion round a vessel, tumors, etc.

Cases occurring as a result of the causes under Class 1 might be con-

sidered as accidental instances of the condition. In the vast majority of instances, the principal etiologic factor is one of the several included under Class 2. Of the forms which develop as a result of bacterial involvement, dermatitis gangrænosa infantum is the most important.

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DERMATITIS GANGRÆNOSA INFANTUM.

Synonyms.—Pemphigus gangrænosus; Varicella gangrænosa; Ecthyma gangrænosa.

Definition.—A gangrenous eruption occurring in children, usually as a sequel to one of the pustular exanthemata.

Symptoms.—The disorder is a rare one, and was first described by Hutchinson as a complication in cases of varicella and vaccinia. Its

Fig. 215.—Dermatitis grangrænosa infantum. Courtesy of Dr. M. C. Stone.)

occurrence has also been noted in rubeola and purpura. The lesions are round, oval or irregular, pea-sized or larger, superficial, gangrenous sloughs which supervene on the bases of the preceding vesicular or pustular lesions. Patches of considerable extent may result from the confluence of contiguous ulcers. The trunk, buttocks, and thighs are the sites of predilection. There are accompanying symptoms of systemic disturbance (vomiting, chills and fever), throughout the course of the attack which may last for several weeks or months. There is some resultant scarring, and more or less temporary pigmentation.

Etiology.—The exciting cause is not definitely known, but is very probably microbic, although the bacteriologic findings of various observers are at variance. The disease occurs oftenest in debilitated, marasmic, female infants and young children.

Diagnosis.—The lesions may bear some resemblance to those of congenital syphilis.

Prognosis.—The outlook is dependent upon the extent of the eruption, and the general condition of the patient. In the majority of instances recovery ensues.

Treatment.—A tonic and supportive line of treatment is advisable. Vaccine therapy may prove beneficial in prolonged attacks. Locally, mild antiseptic dressings (lysol 0.5 to 1 per cent) or salves (ammoniated mercury, 2 per cent) may be employed.

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DERMATITIS GANGRÆNOSA INFANTUM.—*Hutchinson*, Med. Chirurg. Trans., London, 1882, lxv, p. 1. — *Elliot*, Med. Record, New York, 1891, xxxix, p. 562. — *Hitschman and Kreibich*, Arch. f. Dermat. u. Syph., 1892, i, p. 81. — *Hitschman and Kreibich*, Wien. klin. Wchnschr., 1897, x, p. 1093.

SYPHILITIC GANGRENE.

Gangrene following syphilitic endarteritis is comparatively rare. It is of the dry type, and commonly involves the extremities. Senile gangrene may occur as a result of calcareous degeneration of the arterial walls with consequent obliteration of the caliber of the vessel. Degenerative vascular changes are also strong predisposing factors in the so-called "pressure gangrene," or acute decubitus.

SYMMETRIC GANGRENE.

Synonym.—Raynaud's disease.

Definition.—A disorder usually involving the extremities and characterized by local ischemia, generally followed by asphyxia and certain nutritional changes which may result in symmetrical gangrene, or in atrophy of the cutaneous structures.

Symptoms.—The fingers and toes are the parts most frequently attacked, although the ears and nose occasionally are involved. The onset is usually gradual, and is characterized by attacks of paroxysmal ischemia (paleness and coldness) or of asphyxia (cyanosis). The two conditions may alternate, and in any given case either may predominate, although about 90 per cent of the cases are cyanotic in character, and it is in this type that gangrene is prone to supervene. There is usually more or less accompanying pain of a dull, throbbing character, and the affected areas may be partially or wholly anesthetic. In cases affecting the nose or ears, the gangrenous stage is seldom reached, but in those instances presenting involvement of the fingers and toes necrosis occurs in about 70 per cent. (Monro). The ensuing gangrene may be either dry or moist. The affected area may be small and cir-

cumscribed, or it may include the entire finger or toe. In the moist type vesicles and bullae which are sometimes, but rarely, hemorrhagic, may develop. In the majority of instances the involvement is symmetrical.

Etiology and Pathology.—The essential cause is unknown. It is most frequent in young adults, and in individuals whose nervous sys-

Fig. 216.—Ulceration in Raynaud's disease. (Courtesy of Dr. M. C. Stone and Dr. O. L. Castle.)

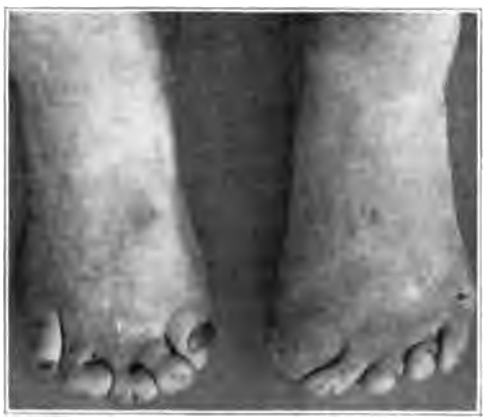

Fig. 217.—Raynaud's disease, showing unusual deformity of toes. (Courtesy of Dr. John W. Perkins.)

tems are unstable. It affects females more frequently than males. It sometimes occurs as a complication of scleroderma. The paroxysmal character of the vascular spasms would indicate that the condition is

an angioneurotic one, and the distribution would indicate involvement of the central nervous system.

Diagnosis.—The distribution and character of the lesions, together with the course of the disease, constitute a distinctive clinical picture.

Prognosis.—In extensive and in septic cases, occurring in weak or debilitated individuals, the outlook is grave. In the majority of instances the prognosis is good in so far as the life of the patient is concerned, but permanent freedom from attacks can never be promised.

Treatment.—The patient's general condition should be carefully investigated. The effects of amyl nitrate, glonoin, and similar drugs are too transitory to be of permanent service. Galvanism may prove helpful. Early in the disease friction and the application of stimulating liniments sometimes prove helpful. The treatment of gangrenous lesions is essentially surgical.

MULTIPLE GANGRENE IN ADULTS.

Under this heading may be placed certain instances of gangrene of the skin occurring as a result of intense, localized inflammatory processes, as in infected wounds and severe types of zoster. In Hartzell's patient the affection developed following an infected wound, and proved extremely resistant to treatment. Multiple gangrenous lesions have also been observed in connection with certain systemic disorders, particularly typhoid fever, malaria, and the exanthemata. I have seen a severe case develop during the course of an acute attack of nephritis. As Towle has suggested, it is very probable that the vast majority of cases of "hysteric gangrene" are really examples of dermatitis factitia.

Prognosis.—The outlook is mainly dependent upon the general physical condition of the patient, and is usually good.

Treatment.—Tonics are generally indicated. Locally antiseptics, and particularly tincture of iodine and pure carbolic acid (Parks), are beneficial. Curettage, followed by moist dressings (lysol 1 per cent, or mercuric chloride, 1-3,000) often proves helpful. The removal of the underlying cause, if discoverable, is, of course, essential.

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DIABETIC GANGRENE.

In patients suffering from diabetes mellitus, slight injuries of the skin are sometimes followed by the development of localized gangrenous areas. The lesions, which are usually moist, are rounded, oval, or irregular in outline, and may be so deep as to involve the subcutaneous tissue. A spontaneous variety has also been described. In this type the eruption may be more or less symmetrical, and the formation

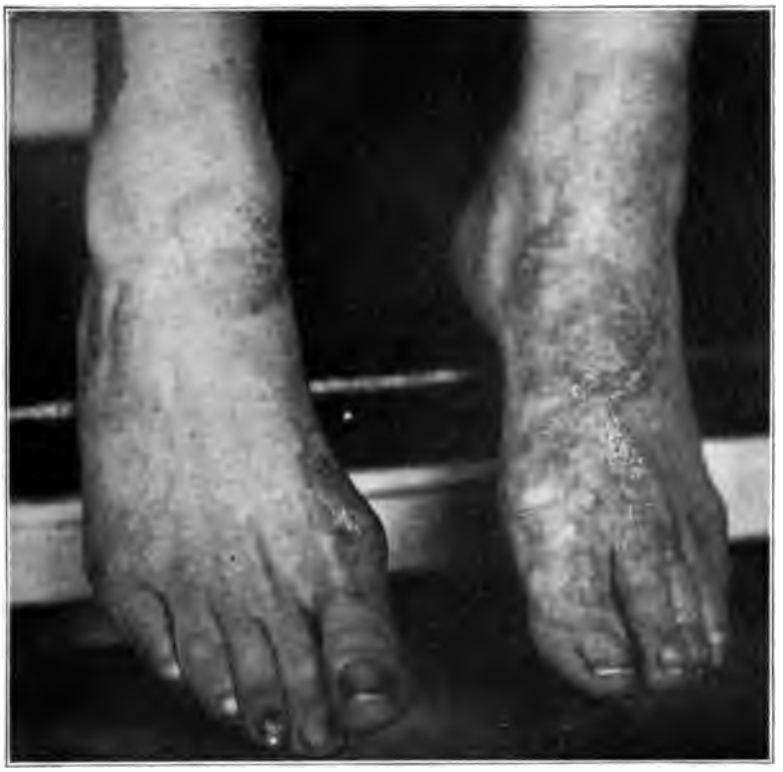

Fig. 218.—Lesions on feet and ankles in a case of diabetes mellitus.

of the gangrenous patches may be preceded by the development of bullae.

Etiology.—The lowered resistance to bacterial infection in patients of this class is the principal predisposing factor. The exciting cause is probably microbic.

Prognosis and Treatment.—The prognosis is unfavorable, and the treatment is surgical.

REFERENCE.

DIABETIC GANGRENE.—*Burnside Foster*, Tr. Sec. on Dermat. A. M. A., 1913, p. 80.

Fig. 219.—Gangrene, in a diabetic.

Fig. 220—Gangrene occurring as a sequel of diabetes. (Courtesy of Dr. Otto Leslie Castle.)

DERMATITIS DIPHTHERITICA.

Synonyms.—Cutaneous diphtheria; Diphtheria of the Skin.

Diphtheria of the skin was first described by Chomel in 1759, and Trosseau made an exhaustive clinical study of the disorder in 1830. Neisser first investigated the cutaneous type bacteriologically. It is probable, as Trosseau originally contended, that infection always occurs through some break in the continuity of the skin. The skin may be involved either primarily or secondarily, and infection may occur by autoinoculation, by contact with an infected individual, or through the use of contaminated articles, such as eating utensils, clothing, etc. The most frequent eruption is of the false-membrane type (gray, ulcerating patches developing around the margins of a swollen and inflamed wound). In addition to this variety, Knowles and Frescoln have collected reports of cases which were characterized by the development of "ulcerative, gangrenous, eczema-like, impetiginous eczema-like, pustular and impetigo-like, ecthymatous, vesicular and varicella-like, bullous, dermatitis herpetiformis-like, carbuncular, and tumor and abscess lesions."

Etiology.—The disorder is due to infection with the Klebs-Loeffler bacillus, although other pathogenic organisms (particularly streptococci and staphylococci) are generally present also.

Prognosis.—The condition is an exceedingly dangerous one, to both the patient and his associates.

Treatment.—Large doses of antitoxin should be administered. Locally, antiseptics, in the form of salves or moist dressings, may be employed. Needless to state, a rigid quarantine should be enforced.

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DERMATITIS CALORICA.

This term includes all affections of the skin which may result from the action of heat or cold. If induced by exposure to excessive heat, *dermatitis ambustionis* results, if by excessive cold, *dermatitis congelationis.*

DERMATITIS AMBUSTIONIS.

Symptoms.—Burns vary in degree from slight redness to actual tissue necrosis. Clinically they may be divided into three classes, accord-

ing to their severity: (1) Those characterized by the presence of the inflammatory signs of heat, pain, redness, and swelling. This variety is known as *dermatitis ambustionis erythematosa.* (2) Burns of the second class, or degree, are characterized by the above symptoms, plus serous exudation, which results in the formation of vesicles and bullae. (3) Under this class are included all thermic injuries of the skin resulting in destruction and loss of tissue substance. The manifestations of constitutional involvement vary with the degree and extent of the injury. If considerable areas of skin are involved (one-third or more of the body surface) the result is likely to prove serious, particularly in infants and in elderly persons. The cause of death in these cases can seldom be definitely ascertained, and probably varies considerably in different cases. Gastric and duodenal ulceration are frequently present. It is probable that shock, changes in the red and white cells, and the absorption of toxic products all play a part. In some instances serious complications, such as pyemia and erysipelas, and even tetanus, may supervene.

Treatment.—In severe cases a tonic and supportive plan of treatment is to be advised. In the milder, localized examples soothing and protective lotions (such as calamine lotion, or a mixture of equal parts of black wash and lime water) are all that is needed. In burns of the second degree, the vesicles should be incised and drained, and a moist, antiseptic dressing, or an ointment, applied. Aqueous solutions of sodium bicarbonate (5 per cent), lead and opium lotion, or carron oil may be employed. I have found carbolized zinc oil, spread on old linen, and renewed three or more times daily, an excellent remedy. If there is much superficial necrosis, a small amount of ammoniated mercurial ointment may be added to this combination. In severe and extensive cases, the continuous water bath may be required. Applications of picric acid solution I mention only to condemn. In my experience, and I have seen the remedy employed in a large number of cases, the results have never proved satisfactory, and the vast majority of patients complain bitterly of the non-comforting character of the dressing. Carbolized or plain petrolatum, or even lard, is far superior to it in every respect. During the past three years, the use of hot wax has gained considerable vogue in the treatment of burns of all degrees. The most popular preparations are those containing a mixture of wax, resin, and a soothing antiseptic, as eucalyptol. The mixture is heated on a water-bath, and after thoroughly cleansing and disinfecting the wound,

is sprayed directly on the injured surface. In suppurative cases absolute cleanliness is essential, and the dressings should be changed at least once, and better several times, daily. In those instances in which the deeper tissues are involved the treatment is essentially surgical.

REFERENCE.

DERMATITIS AMBUSTIONIS.—*Ravogli*, Tr. Sec. on Dermat., A. M. A., 1915.

DERMATITIS CONGELATIONIS.

Symptoms.—The most common examples of dermatitis from congelation are reddish or violaceous, localized plaques or patches occurring on the hands and feet and, occasionally, on the face or ears, and known as chilblains *(perniones)*. These lesions are often persistent, and give rise to smarting, burning and itching sensations, especially when the part becomes warm. The more severe types of frost-bite correspond to burns of the second degree, and are characterized by the development of vesicles and bullae, occasionally with the subsequent formation of ulcers. In the most severe examples of frost-bite, moist gangrene often results, and is generally accompanied by systemic disturbance of varying degree. The necrosis may involve only the skin and subcutaneous tissue, or it may include the entire part. The hands and feet are most frequently attacked.

Treatment.—Stimulants, particularly strychnia, are indicated at first, and ferruginous tonics later. If reaction has not yet occurred, the temperature of the parts should be restored by gentle and persistent rubbing with ice water or snow, the patient meanwhile remaining in a cool room. Afterward, recourse may be had to compresses moistened with a saturated aqueous solution of magnesium sulphate, or to ointments containing ichthyol (10 to 25 per cent), or small amounts of salicylic acid (2 to 5 per cent) and zinc oxide (10 per cent).

DERMATITIS VENENATA.

Definition.—An inflammation resulting from the action of various animal, vegetable or mineral substances on the surface of the skin.

Symptoms.—The lesions vary considerably in character, and all degrees of inflammation, from simple hyperemia to actual gangrene and sloughing, are encountered. The majority are at first erythematous, and sharply limited to the surface touched by the irritant. Later they may become papular, vesicular or pustular, and in some instances they may become eczematous, increase in size, and extend far beyond

their original boundaries. As a rule the eruption is self-limited, and disappears spontaneously, without scarring, in the course of a few days or weeks. The lesions usually give rise to more or less burning and itching. The hands and forearms and the face are the sites of predilection, although no region is exempt.

Etiology.—The list of possible causative agents is almost interminable. Numerous drugs, and particularly the more powerful antiseptics, are capable of producing a dermatitis. Other frequent chemical causes are strong acids and alkalies, mustard, arnica, turpentine, iodoform, tar, pyrogallol, mercurial compounds, formalin, croton oil, chrysarobin, and hair-dyes containing silver nitrate, paraphenylen diamine and similar deleterious substances. Long continued contact with decomposed and ammoniacal urine, and purulent and pathologically altered discharges may give rise to irritation and inflammation of the skin. Plant poisoning is one of the most common of all sources of the disorder, particularly in America, as J. C. White, Morrow, Foerster, Mewborn, C. A. Simpson, and others have shown. The poison ivy *(Rhus toxicodendron)* and the primrose *(Primula obconica)* are two of the most frequent offenders. Individual susceptibility to irritation from ivy varies greatly. Some persons apparently are immune, while others are so vulnerable that they cannot even approach the plant with safety. The poison may be conveyed indirectly as well as by contact, and in extremely susceptible individuals typical attacks may develop without apparent cause. The exact nature of the irritant is not definitely known. In view of its peculiar mode of action, it is possible that anaphylaxis may play some part in the causation. The hands, feet, and face, and the genital and anal regions are the parts commonly affected. As in drug dermatitis the disorder tends to run an acute course and subside spontaneously in the course of a week to a month, but recurrences are not infrequent. Lain, of Oklahoma City, has described some very interesting cases of dermatitis due to irritation from the tomato plant (Lycopersicum esculentum). Rendu, Sequiera, Tyson, Frescoln, and Cripps have recently called attention to the dermatoses due to contact with and manipulation of explosives. The chemicals most frequently at fault are cresylite, tolite, Schneiderite, tetryl, melinite, and dichlorethylsulphide ("mustard gas"). The irritant may be given off either in the form of a powder or a vapor. Both skin and mucous membrane are affected. Warthin, Weller, Roos, and Herrmann have

made some very interesting experimental studies on the action and treatment of "mustard gas" on men and animals.

Diagnosis.—The acute onset, the violent character of the outbreak, the location of the involved regions, the occupation of the patient, and a history of exposure will serve to exclude eczema.

Prognosis.—The removal of the cause is usually promptly followed by recovery. In rhus poisoning, however, repeated attacks are common.

Treatment.—The treatment is not unlike that of an acute eczema.

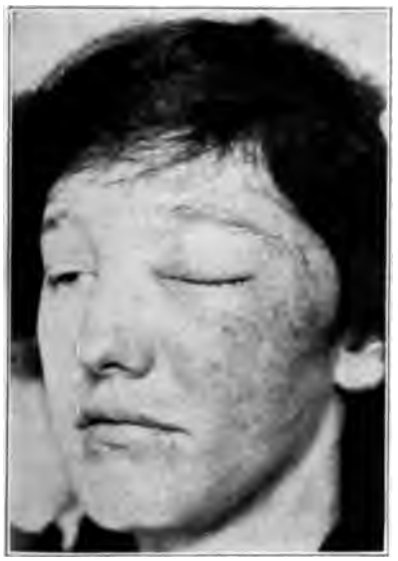

Fig. 221.—Dermatitis venenata due to ivy.

Fig. 222.—Dermatitis due to poison ivy. Note the presence of the numerous thin-walled vesicles.

The bullae should be incised and drained, and the entire part sponged with alcohol. The affected areas should be given a preliminary soap and water bath, followed by alcohol, to remove any possible remaining toxicodendrol oil. It is well to commence with clear lotions, and gradually change over to powder mixtures and ointments. Aqueous solutions of aluminum acetate (2 to 5 per cent), or of lead acetate or lead lactate (1 to 5 per cent), or lead and opium lotion, may be freely applied on gauze. A saturated aqueous solution of sodium sulphite, to which carbolic acid

(.5 per cent) has been added, has proved serviceable in my hands. Duhring recommends continuous applications of the fluid extract of grindelia robusta mixed with water (1 to 4). Knowles speaks highly of a mixture of boric acid (2 parts), bismuth subgallate (4 parts), glycerine (1 part) and camphor water (64 parts). J. E. Lane advises the application of aqueous solutions of boric acid on cheese cloth compresses. After the parts have become dry and scaly, calamine lotion may be employed during the day time, and carbolized zinc oil at night. Care must be taken to avoid the use of soap and water until the parts are completely healed. In the treatment of "mustard gas" burns, Warthin and his coworkers found that prompt washing with green soap greatly reduced the severity of the lesions. If allowed to remain on the skin, however, the burns are deep and severe, although comparatively painless. For treatment, they recommend the immersion of the injured parts in Dakin's solution (strength of about 0.5 per cent hypochlorous acid, or weaker), or the application of wet dressings saturated with the same solution. If the wet method be impracticable, the application of dichloramine-T in chlorozone or chloramine-T in sodium stearate may be used. After this primary disinfection of the skin, the Dakin's solution can be alternated every two or three hours with a sterile hypertonic, or sterile physiologic, saline solution. Vesicles should be incised and drained. These authorities condemn dressings containing grease, oil or paraffin.

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MATCH-BOX DERMATITIS.

Rasch, Jacobsen, Olivarius, and Lomboldt in Denmark, and more recently, George Henry Fox in New York, and Charles J. White, of Boston, have called attention to a novel dermatosis which is suggested by the name of "match-box dermatitis." The affection is characterized by the occurrence of a reddened, rough, scaly, slightly thickened patch of dermatitis on the thigh or buttock, and is due to the irritation of the chemical agent (probably phosphorus) on the dark brown striking surface of the match-box habitually carried in the pocket overlying the eczematous patch.

Recovery is usually prompt, following the removal of the cause.

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X-RAY AND RADIUM DERMATITIS.

Synonym.—Dermatitis actinica.

Definition.—An acute or chronic inflammation of the skin due to the action of the Röntgen rays or of radium.

Symptoms.— The reaction following a single overexposure to the x-rays varies in degree from a reddish erythema resembling sunburn to actual gangrene and sloughing of the tissues. The reaction appears slowly, in from two to seven days after exposure. In the milder acute cases, the redness, which is accompanied by burning and itching, disappears in the course of a week or ten days, leaving no trace, but in the chronic cases which result from the excessive employment of the agent in doses which, if taken singly, would not give rise to erythema, the skin becomes thin, dry, atrophic and wrinkled, with more or less brownish pigmentation. Occasionally, and particularly in individuals who are already the subjects of a dry seborrhea of long standing, keratoses develop, many of which ultimately become carcinomatous. If the affected area involves the scalp, permanent alopecia may result. If on the hands, the nails may become thinned, striated and brittle. In the severe, acute types, a marked dermatitis develops, with the formation of vesicles and bullae, to be followed by more or less necrosis and sloughing. The ulcers thus formed are covered with thick, tough, adherent, brownish or grayish membranes and are exceedingly painful. They heal very slowly, if at all. Radium burns are very similar to those

caused by the x-ray, but are less painful, and heal far more readily.

Etiology.—The exact manner in which x-ray burns are caused is not known. Susceptibility is undoubtedly an important factor. Individuals whose skins contain very little pigment are exceedingly sensitive to the action of the agent, and serious injury may follow exposures of even moderate duration. As Knowles has said, the reaction is chiefly

Fig. 223.—Röntgen dermatitis.

Fig. 224.—X-ray keratoses.

due to this factor, plus the closeness, and comparative vacuity of the tube, and the length and frequency of the exposures. Low vacuum ("soft") tubes are the most dangerous.

Pathology.—The pathology of x-ray burns has been carefully studied by Pusey. "The first changes that occur are those in the epidermis. There is a marked hyperplasia of the prickle-cell layer, with

increase in number of cells, and increased formation of pigment and of keratohyalin, followed after further exposure by breaking up of nuclei or division of the nuclei without true mitoses occurring, and later degeneration of the cells and, if the process proceeds further, there is complete disintegration. Along with these changes there are similar changes in the appendages, which may, if the reaction is sufficiently intense, lead to atrophy or entire destruction. All the changes point to a reaction produced by an irritant of unusual character." As Oudin, Barthelemy and Darier have comprehensively expressed it, "This irri-

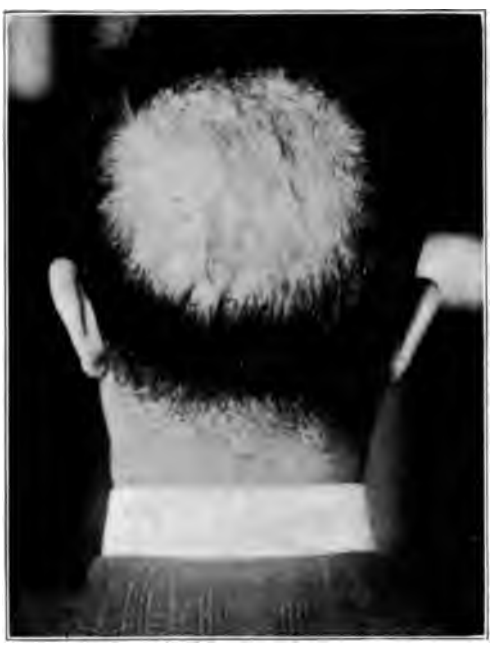

Fig. 225. X-ray alopecia due to exposure made while taking photograph of sinuses. (Courtesy of Dr. Frederick G. Harris.)

tation seems to increase the vitality of the least differentiated elements, while it produces degeneration and atrophy of the more highly differentiated structures, hairs, nails and glands."

The changes in the corium are of similarly striking character. The earliest changes noted are those of an ordinary inflammatory reaction with a free exudation of leucocytes. The corium becomes edematous, the connective tissue fibers swollen, and their staining reaction not as definite as normal. Next, striking evidences of changes in the blood vessels are apparent. As Scholtz describes it,—and other observers

corroborate his description—"the cells of the intima are swollen, project into the lumina of the vessels, and in some places show evident proliferation with a tendency to fall off into the blood vessels."

Treatment.—The penetrating, curative rays are the least irritating. Consequently, in employing the x-rays or radium, it is advisable to employ "filters" of leather, chamois, or better, aluminum or silver. Needless to state, the surrounding skin should always be protected by

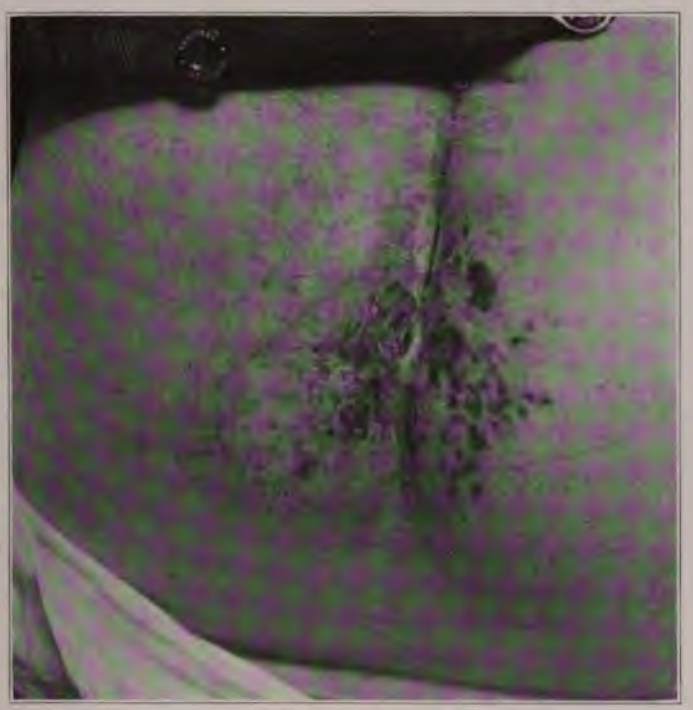

Fig. 226.—Ulceration following x-ray burn of buttocks.

lead foil. In the milder types of dermatitis, astringent, soothing lotions (lead and opium, equal parts of black wash and lime water, or 5 per cent aqueous solution of aluminum acetate) give the best results. Boric acid ointment, to which carbolic acid (.5 per cent) and menthol (.5 per cent) have been added, often proves comforting and curative. Chronic x-ray ulcers sometimes respond favorably to Pfannensteil's method of treating lupus—the patient is given 45 grains (3.0) of sodium iodide internally per day, and the lesion is constantly moist-

ened with a 2 per cent solution of hydrogen peroxide. In the gangrenous cases the treatment is surgical.

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Fig. 227.—X-ray carcinoma. Low magnification.

DERMATITIS MEDICAMENTOSA.

Synonyms.—Drug eruptions; Medicinal eruptions.

The character of the eruptions due to the ingestion or absorption of drugs is, with one or two exceptions (bromine and iodine), seldom distinctive and characteristic. It may simulate almost any condition or disorder, and for that reason careful inquiry and investigation are sometimes necessary in order to eliminate the various medicinal agents as a possible causative factor in skin lesions of an unusual or puzzling type. There may be more or less associated constitutional disturbances in those drug eruptions which simulate the exanthemata, but as a rule this fea-

ture is absent. Subjective symptoms, particularly burning and itching, likewise are present in some (especially those of an urticarial type) and absent in others.

Etiology.—In the majority of instances the eruption is credited to a certain idiosyncrasy which the affected individual exhibits toward the particular drug in question. This idiosyncrasy may persist indefinitely or it may ultimately be overcome by beginning with a

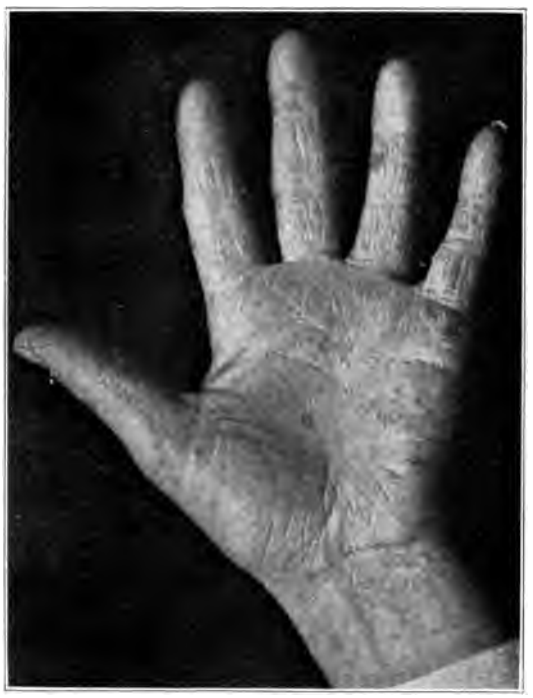

Fig. 228.—Keratosis of palm due to arsenic. (Courtesy of Dr. Louis P. Hamburger.)

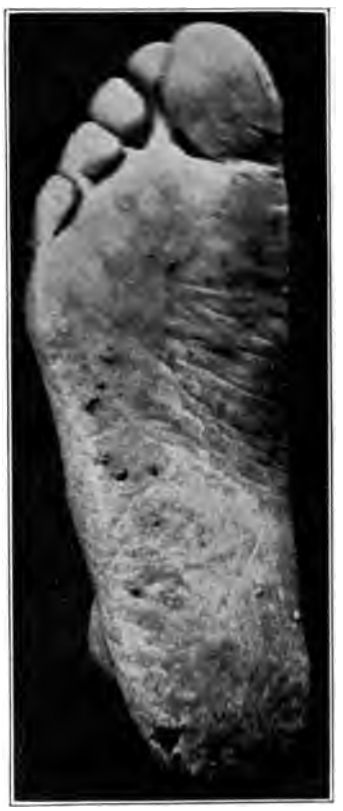

Fig. 229.—Arsenical keratoses of sole. (Courtesy of Dr. Louis P. Hamburger.)

minute initial dose and gradually increasing the amount. It is possible that the absorption of certain medicinal agents gives rise to the formation of substances which act as foreign proteids, and that in susceptible or sensitized individuals these bodies in turn give rise to anaphylactic phenomena, with associated cutaneous manifestation (see anaphylaxis). In addition to this factor, local irritation, resulting

from the presence of the drug in the skin glands during the process of elimination (Engman and Mook), and associated heart and kidney disease undoubtedly play important parts in the causation at times.

Diagnosis.—The sudden onset, the atypical character of the eruption, the usual absence of constitutional symptoms, and, above all, the history, will aid in formulating a correct diagnosis.

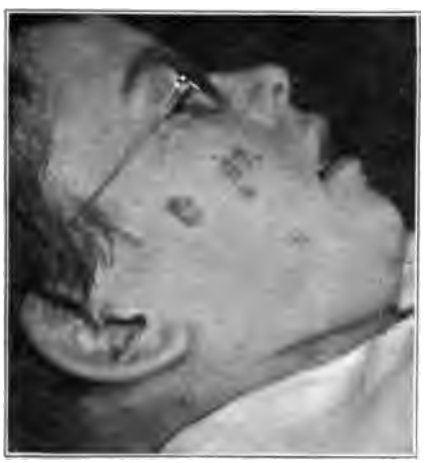

Fig. 230.—Bromide eruption in a girl of eight.

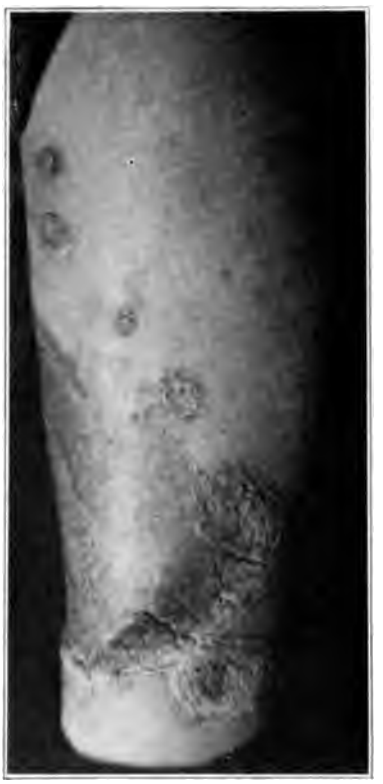

Fig. 231.—Bromide eruption, the patient being an epileptic.

Treatment.—The removal of the causal factor is the most important step. Following this, the free use of saline cathartics and alkaline diuretics, together with plentiful amounts of drinking water, is helpful. Locally, calamine lotion, zinc oil and similar soothing applications are to be advised. From the viewpoint of prophylaxis, the sodium salts usually prove less irritating to both skin and kidneys than the potassium preparations. Crocker and others have suggested the conjoint administration of arsenic (liquor potassii ar-

senitis) or of salol with the bromides and iodides, in the belief that it lessens the tendency to skin involvement.

The following summary includes the majority of drugs which may give rise to cutaneous eruptions.

Aconite.—Erythematous. May be vesicular.

Acetanilide.—Generalized erythematous eruption. In large doses, or when administered to patients suffering from weak hearts, frequently causes cyanosis of lips, ears and extremities.

Antipyrine.—Fairly common, usually morbilliform. May be urticarial, scarlatiniform or even bullous. May involve mucous membranes. Moderate itching. Fournier has recorded cases in which the penis

Fig. 232.—Eruption following ingestion of balsam of copaiba. (Courtesy of Dr. A. J. Markley.)

Fig. 233.—Bromide eruption in an epileptic. (Courtesy of Dr. E. J. Angle.)

turned black ("verge noire") from pigmentation following an antipyrine eruption (Crocker).

Antitoxin.—Not infrequent. Urticarial, erythematous, scarlatiniform, and polymorphous. Especially common following second dose of serum. More or less itching.

Arsenic.—Less commonly observed than formerly when arsenic was employed much more frequently than it is now. The lesions may be erythematous, scarlatiniform, papular, vesicular, herpetic, pustular, urticarial, keratotic, pigmentary, ulcerative, or even carcinomatous. Hutchinson, Railton, Crocker, Zeisler, and others have called attention to this agent as a causative factor in herpes zoster, and it is probable

that the drug gives rise to changes in the posterior spinal ganglia as well as in the nerve trunks and terminal fibers. The palmar and plantar thickening begins around the sweat follicles, but ultimately involves the entire corneous layer, presenting a clinical picture practically indistinguishable from keratosis palmaris et plantaris hereditaria. S. Ayres, Jr., has recently reported an interesting case in which absorption occurred while the patient was spraying fruit trees with Paris green.

Arsphenamine.—Occasional, particularly following intravenous injections. Erythematous, scarlatiniform, morbilliform, and eczematous, followed by desquamation.

Aspirin.—Uncommon. Erythematous, papular, at times hemorrhagic.

Fig. 234.—Iodide rash in a nursing infant whose mother was taking large doses of the drug. (Courtesy of Dr. E. Wood Ruggles.)

Belladonna.—Not uncommon. Erythematous or scarlatiniform. May follow application of belladonna plasters. Eruption may be patchy or more or less generalized, and is usually itchy, sometimes intensely so.

Benzoate of Sodium.—Rare. Erythematous or papular.

Boric Acid.—Infrequent. Erythematous, papular, vesicular, bullous, or multiform. May give rise to edema of the eyelids, and conjunctivitis.

Bromine Compounds.—Fairly common, particularly in epileptics. Develop slowly and usually are persistent. Erythematous, pustular, urticarial, furuncular, condylomaform, bullous and squamous. Eruption may be localized or general. The lesions sometimes coalesce, forming segmental plaques which are very suggestive of lues.

Cannabis Indica.—Rare. Vesicular. Itchy. May give rise to transient pigmentation.

Cantharides.—Uncommon. Erythematous and papular. Predilection for genital region.

Capsicum.—Exceptional. Erythematous or papulovesicular.

Chloral Hydrate.—Not infrequent. Papular, lichenoid, urticarial, purpuric, erythematous, and scarlatiniform. Exceptionally bullous.

Fig. 235.—Iodide eruption. (Courtesy of Dr. J. C. White.)

May be accompanied by cyanosis of extremities. Itching and burning at times.

Chlorate of Potassium.—Rare. Erythematous, papular or multiform.

Chloroform.—Not uncommon. Erythematous or purpuric.

Cod-liver Oil.—Rare. Acneiform. Excessive amounts of substances rich in butter fat (cream, for example) may have a similar effect.

Copaiba.—Fairly common. Erythematous, scarlatiniform, papular and urticarial, followed by slight desquamation.

Cubebs.—Rare. Morbilliform and papular.

Fig. 236.—Iodide eruption. (Courtesy of Dr. J. C. White.)

Fig. 237.—Iodoform dermatitis. (Courtesy of Dr. John W. Perkins.)

Fig. 238.—Iodoform dermatitis. (Courtesy of Dr. John W. Perkins.)

Digitalis.—Infrequent. Scarlatiniform, erythematous, and papular, followed by desquamation.

Ergot.—Rare, particularly in America. May result from eating ergoted grain. Vesicular, bullous, pustular, furuncular, and gangrenous.

Hyoscyamus.—Rather uncommon. Erythematous, pustular and purpuric.

Iodine Compounds.—Common. Erythematous, purpuric, papular, urticarial, nodular, pustular, bullous, carbuncular, and vegetating. The sites of predilection are those areas which are richest in sebaceous glands —the face, shoulders and back—although no region is exempt. The lesions may be discrete or confluent, and there may be more or less associated suppuration and ulceration, with resultant scarring. The eruption generally appears rather promptly (within twenty-four or forty-eight hours), but is usually persistent. The mucous membranes are occasionally involved.

Iodoform.—Rare, because of the fact that iodoform is now seldom employed. Macular, purpuric, papular, vesicular, bullous and polymorphous.

Mercury.—Uncommon. Erythematous and scarlatiniform, occasionally followed by desquamation.

Morphia.—Erythematous, maculopapular, vesicular, urticarial, and ulcerative. Usually accompanied by intense itching.

Quinine.—Not infrequent. Erythematous, scarlatiniform, purpuric, urticarial, vesicular, bullous, and ulcerative, attended with severe pricking and itching. There is usually subsequent desquamation, occasionally with attendant furunculosis or carbunculosis. Idiosyncrasy appears to be an important factor in many instances.

Salicylic Acid and the Salicylates.—Rather uncommon. Erythematous, scarlatiniform, morbilliform, urticarial, vesicular, bullous, and, rarely, ulcerative.

Silver Nitrate.—Rare. Slate-colored pigmentation following prolonged administrations of the drug. Formerly not uncommon, but now seldom seen.

Sulfonal.—Exceptional. Erythematous and scarlatiniform.

Thallium Acetate.—Not uncommon. Alopecia.

Tuberculin.—Infrequent. Erythematous, urticarial, and nodular. May simulate erythema nodosum.

Turpentine.—Uncommon. Erythematous, papular, and morbilliform. More or less itching.

Vaccines and Bacterins.—Fairly common. Erythematous, papular, and urticarial. Itching of variable degree.

Veronal.—Infrequent. Erythematous, scarlatiniform, morbilliform. Rarely vesicular or bullous.

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DERMATITIS FACTITIA.

Synonyms.—Feigned eruptions; Dermatitis artefacta.

Under this title are included those injuries of the skin which are

Fig. 239.—Dermatitis factitia. Weapon employed was a pair of sharp-pointed scissors. (Courtesy of Dr. H. C. Varney.)

self-inflicted, usually with the object of exciting sympathy, or escaping duty.

Symptoms.—The lesions appear suddenly, and vary widely in character and distribution. As a rule they are sharply defined, localized on some part of the body which is readily accessible to the

patient. Thus in individuals who are right-handed, the eruption will be on the left hand or arm, the left side of the chest, or the right

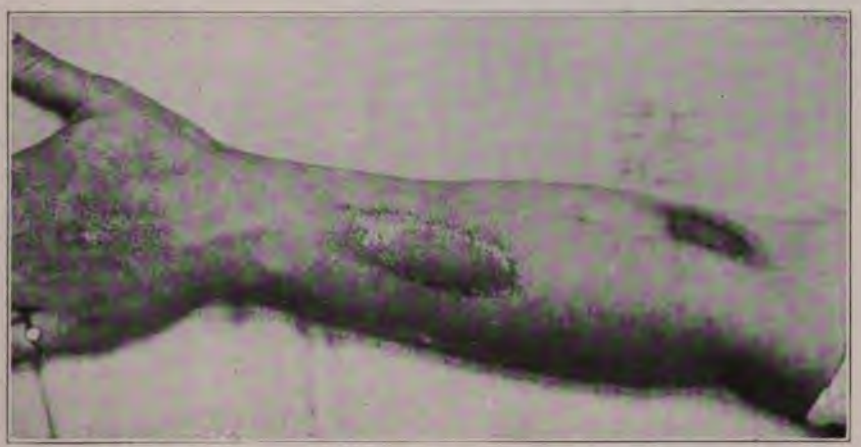

Fig. 240.—Dermatitis factitia. (Courtesy of Dr. H. C. Varney.)

Fig. 241.—Dermatitis factitia. (Courtesy of Dr. H. C. Varney.)

thigh. The lesions are asymmetrical, and often irregular or angular in outline. They are usually erythematous, vesicular, bullous, or ulcerative in character, and may be produced by any one of a large

number of agents. Simple friction, with a finger tip moistened with saliva, or applications of lye, mineral acids, phenol, cantharides, mustard, croton oil, and similar substances, and burning with matches,

Fig. 242.—Dermatitis artefacta. Phenol was the irritant employed.

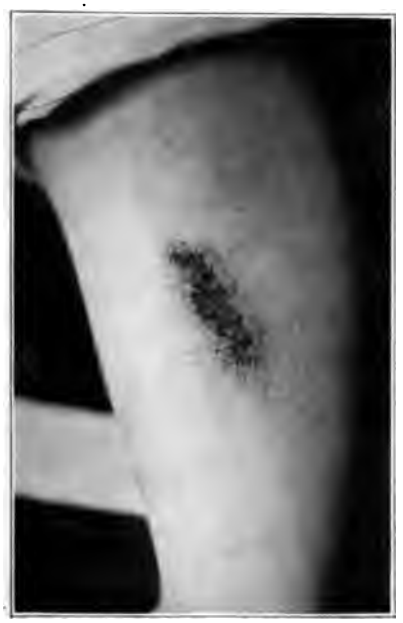

Fig. 243. Dermatitis artefacta. Lesions were made with the splintered end of a piece of wood.

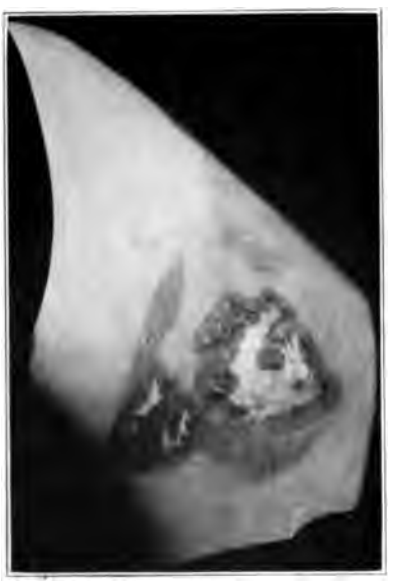

Fig. 244.—Dermatitis artefacta, due to the application of a mineral acid.

hot metals, and acids are some of the methods commonly employed. It is very probable that many cases of disseminated gangrene of the skin are in reality examples of dermatitis factitia. The cases are

generally observed in confirmed malingerers, and in neurotic individuals, particularly emotional and hysterical girls.

Diagnosis and Treatment.—The character of the lesions, and the persistence of the eruption are valuable differential points. In suspicious cases the patient should be secretly watched until positive evidence of guilt is secured when the patient should be told, privately, firmly and quietly that the truth is known. In some instances the employment of fixed dressings, which prevent further injury to the part, is helpful in formulating a diagnosis.

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THE EXANTHEMATA.

The diagnosis and treatment of the acute eruptive fevers fall to the lot of the internist or the general medical man far oftener than to the dermatologist. Because of this fact, only the cutaneous characteristics of the various disorders included under this heading will be emphasized here. For a more complete discussion of the general symptomatology and treatment, a standard work on general medicine should be consulted.

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VARIOLA.

Synonym.—Smallpox.

Definition.—An acute infectious systemic disease, accompanied by a characteristic eruption which is at first papular, and later vesicular and pustular, and finally terminates in incrustation, with or without resultant scarring.

Symptoms.—The period of incubation varies from seven to sixteen days. My friend, Dr. John L. Sippy, of Topeka, who has had wide experience in this disease, tells me that the incubation period of the affection as seen in Kansas is almost invariably fourteen days. The onset is abrupt, with more or less prostration from the

first. The subjective symptoms of frontal headache, vertigo, chills, nausea, and backache in the lumbar and sacral regions, are almost invariably present. The headache, the fever, and the severe lumbago-like pains usually subside with the appearance of the eruption, to reappear, although usually with lessened severity, with the beginning of pustulation. A peculiar rash (the *"roseola variolosa"* of some writers) occasionally develops on the second or third day, and persists for a few hours. The fact that cases presenting these

Fig. 245.—Variola. (Courtesy of Dr. Jay F. Schamberg.)

Fig. 246.—Variola, on seventh day of eruption. (Courtesy of Dr. Jay F. Schamberg.)

phenomena are usually relatively mild ones of variola is probably explained by Welch's observation that the rash occurs more often in varioloid than in unmodified examples of the disease. Rashes of other types, petechial, mixed, and "le rash astacoide" *(lobster rash)* of the French, occasionally are observed. The last named occurs only in the hemorrhagic cases, and is of serious prognostic import. The initial fever, which is usually ushered in by a distinct chill, is often high (from 102° to 105° F.), and the pulse and respiration are accelerated in proportion. The eruption, which is at first macular,

usually appears on the second or third day. The forehead and the flexor surfaces of the wrists are usually involved first. Within a few hours the reddened lesions appear on other areas also, particularly the scalp, neck, forearms, and hands. The papules develop rapidly, in from twelve to twenty-four hours, as hard, shot-like, ele-

Fig. 247.—Variola, ninth day of eruption. (Courtesy of Dr. Jay F. Schamberg.)

vated, round-topped lesions. The eruption is more or less general, but exhibits a marked predilection for certain regions. The face, the forearms and the hands and feet, particularly the palms and soles, seldom escape. The scalp and the back also are usually affected. The mucous membranes are generally involved. Exposed and irritated surfaces are more susceptible to attack than protected

areas, as Ricketts and others have demonstrated. Vesiculation commences on the third or fourth day, and is quickly followed by the development of pustules. By the end of the first week, the lesions,

Fig. 248.—Variola beginning as a lichenoid eruption. (Courtesy of Dr. E. Wood Ruggles.)

all of which are distended with serum and pus, and many of which exhibit a slight degree of central umbilication, are yellowish in color and surrounded by pinkish or reddish, indurated areolae. In severe cases, the lesions may contain an admixture of blood and pus

(variola hemorrhagica pustulosa), or the pustules may become confluent, and a high secondary fever result. During the pustular stage, the character of the fever and the pulse are largely dependent upon the extent of the cutaneous involvement. On the ninth or tenth day of the eruption, many of the pustules exhibit a tendency to rupture, either spontaneously or as a result of slight trauma, and all of the lesions tend to desiccate, forming dry, yellowish, or brownish crusts or scabs. The shedding process generally extends over a period of a month or more. The amount of permanent pitting or scarring is entirely dependent upon the depth of the lesions and the thickness of the epidermis in the involved region.

Varioloid is smallpox which has been modified by vaccination. In this disorder the prodromal symptoms are usually mild, although

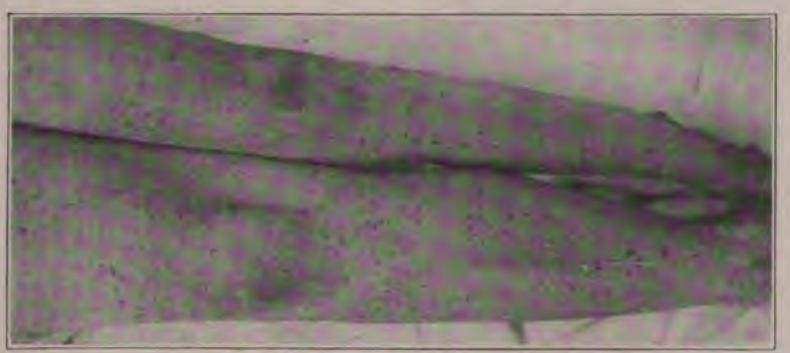

Fig. 249.—Variola hemorrhagica. Death 70 hours after onset of attack. (Courtesy of Dr. E. Wood Ruggles.)

they may be quite severe, and are followed by an eruption which undergoes the same changes as in variola vera. The lesions are generally fewer in number, however, and more superficially seated, and, in consequence, there is less resultant scarring.

Complications.—The most frequent sequelae of smallpox are erysipelas and furunculosis. Infectious eczematoid dermatitis also is not uncommon.

Diagnosis.—The disease is to be differentiated from varicella, dermatitis medicamentosa (particularly iodine and bromine rashes), and the pustular syphiloderm. In varicella the prodromal symptoms are brief and comparatively mild, the eruption usually involving the covered parts (particularly the back) first. The mucous membranes are often involved. There is no secondary fever. The lesions ap-

pear in crops, and are discrete, superficial, short-lived vesicles, of various sizes, which are seldom umbilicated, and rarely give rise to scarring. In the drug eruptions the history, the absence of constitutional symptoms, and the non-involvement of the hands and wrists are valuable diagnostic points. The pustular syphiloderm has no distinct prodromal period, and a history of exposure to smallpox is usually absent. The preceding papules are not hard or shotty, and do not exhibit a predilection for the forehead or wrists. There is no tendency to summit vesiculation as in variola. The constitutional symptoms are comparatively mild, or may be altogether lacking. There is a general lymphnode involvement. In the majority of instances the serum reaction is positive. Impetigo contagiosa may sometimes be confused with smallpox, and I once saw, in the practice of my friend, Dr. R. E. Curry, a case of urticaria papulosa which bore a striking resemblance to variola in the papular stage. The patient was an unvaccinated girl of 16, with a temperature of 101°F., and the eruption was confined almost entirely to the face, hands, forearms, and abdomen.

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VARIOLA.—*Bancroft,* Jour. Med. Research, 1904, xi, p. 322; Idem, ibid., 1904, xi, p. 247 (leucocyte count). — *Sippy,* Bull. Kansas State Board of Health, Nov., 1916, No. II, Vol. xii (with valuable differential tables of varicella and variola). — *Rothwell,* Northwest Med., 1917, xvi, p. 265 (Smallpox in utero).

VACCINAL ERUPTIONS.

Synonym.—Vaccination rashes.

The various eruptions which sometimes occur as a result of vaccination vary considerably in character and in distribution. They may be due directly to the action of the vaccine virus, to various contaminating organisms, or to unknown causes. A few of these eruptions can be correctly attributed directly to the virus, others to various micro-organisms (particularly staphylococci and streptococci), accidentally introduced at the time the vaccine was introduced, and still others, including those of the urticarial and erythema multiforme types, to anaphylaxis. Morris, Frank, and others have logically separated these various etiologic factors into three classes. The following table is a slightly modified form of the one suggested by them:

- 1. Due to vaccine virus.
  - Local
    - Local erythema.
    - Local vaccinia.
    - Dermatitis.
    - Lymphnode involvement.
  - Systemic
    - More or less generalized erythema.
      - Erythema vaccinicum.
      - Roseola vaccinica.
    - Urticaria.
    - Generalized vaccinia.
    - Purpura.
- 2. Due to mixed infection introduced at time of inoculation.
  - Local
    - Impetigo contagiosa.
    - Infectious eczematoid dermatitis.
    - Furunculosis.
    - Erysipelas.
    - Cellulitis.
    - Gangrene.
    - Tuberculosis cutis.
  - Systemic
    - Pyemia.
    - Septicemia.
    - Syphilis.
    - Tuberculosis.
    - Leprosy.
- 3. Sequelae of vaccination.
  - Eczema.
  - Urticaria.
  - Infectious eczematoid dermatitis.
  - Pemphigoid (so-called).
  - Furunculosis.
  - Psoriasis.

The use of clean, reliable preparations of vaccine, and the exercise of cleanliness, will do much in the way of prevention. Proper dressings also are essential. Dyer's suggestion that the vaccinal bleb be allowed to mature, then incised and drained, and the entire area painted with tincture of iodine, to be followed by the application of a sterile gauze pack, is a most excellent one.

REFERENCES.

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VARICELLA.

Synonym.—Chicken-pox.

Definition.—An acute, highly infectious, systemic disorder char-

Fig. 250.—Varicella. (Courtesy of Dr. Jay F. Schamberg.)

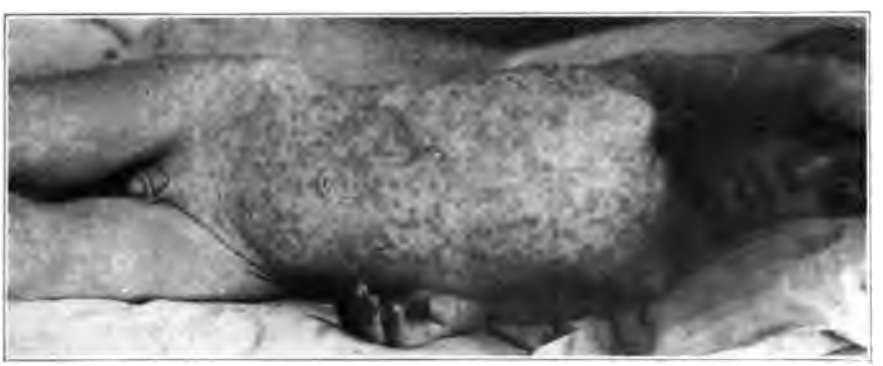

Fig. 251.—Varicella. (Courtesy of Dr. Jay F. Schamberg.)

Fig. 252.—Varicella, in an adult. (Courtesy of Dr. E. Wood Ruggles.)

Fig. 253.—Varicella, in an adult. (Courtesy of Dr. E. Wood Ruggles.)

acterized by an eruption of discrete, thin-walled vesicles, with associated symptoms of slight constitutional disturbance.

Symptoms.—The period of incubation varies from eleven to twenty-four days. The stage of invasion may be marked by some pyrexia, headache, and feelings of general malaise, but these symptoms are often altogether lacking. The lesions usually appear in crops, the

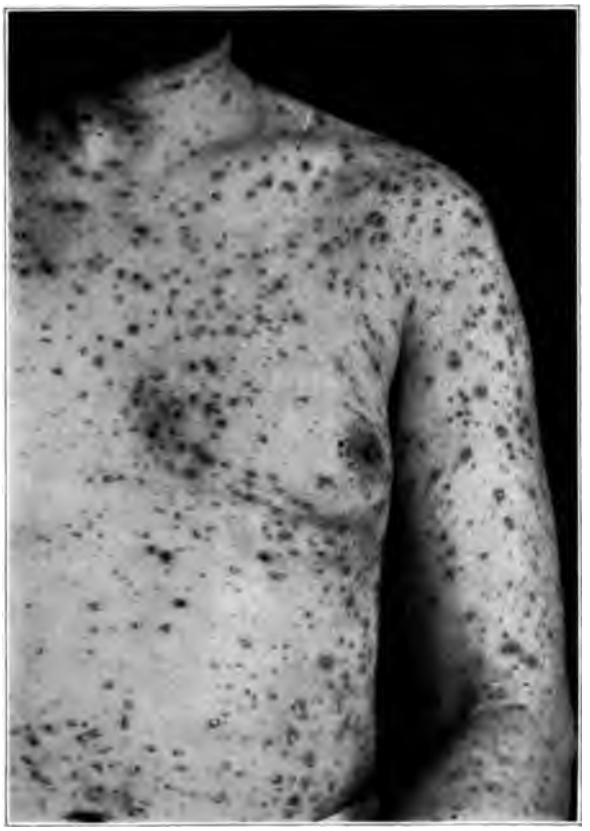

Fig. 254.—Varicella. The lesions are more numerous, and more closely placed than in the average case. (Courtesy of Dr. E. Wood Ruggles.)

trunk, face and scalp being the sites of predilection. The eruption is at first macular, and the vesicles and vesicopapules develop in the centers of the erythematous areas in the course of a few hours. The vesicular lesions are pinhead- to pea-sized, rounded, dome-shaped, and translucent, with or without narrow hyperemic areolae. The areola is probably a result of pyogenic involvement of the enclosed serum,

with resultant irritation of the subjacent structures. Exceptionally a few of the lesions may exhibit central or lateral umbilication, usually a result of trauma with partial escape of fluid. The vesicles rupture easily, and if not broken by scratching, or by friction from the patient's clothing, generally undergo desiccation at the end of forty-eight hours. The mucous membranes are frequently involved. Subjective symptoms are slight, or altogether wanting. Occasionally there is some itching. The crusts are thin, and of the same general outline as the lesions. They become detached in from a week to ten days. There is seldom any resultant scarring.

Diagnosis.—Varicella may be confused with variola. In typical examples of the two disorders differentiation is easy, but in border line cases it is sometimes almost impossible to reach a definite conclusion.

Tièche has called attention to a valuable test for differentiating the two conditions. He found that on his own skin lymph from patients suffering from smallpox or varioloid constantly gave a cutaneous reaction similar to the von Pirquet tuberculin skin reaction. With varicella there was no reaction. The same observer has also pointed out the fact that varicella vesicles can be easily scraped off with a curette; whereas, it is difficult to scrape off a variola pustule.

REFERENCE.

VARICELLA.—*Tièche*, Correspond.-Blatt f. Schweitzer Aerzte, 1917, xlvii, No. 52 (Abst. Jour. A. M. A., 1918, lxx, p. 739).

SCARLATINA.

Synonym.—Scarlet fever.

Definition.—An acute, highly contagious, systemic disorder characterized by fever, angina, and a diffuse, erythematous eruption which appears on the second day and is followed by desquamation which commences at the end of the first week.

Symptoms.—The incubation period is variable, but as a rule it is short—from three to twenty-one days. The onset is usually sudden. Convulsions are not uncommon, particularly in infants and in young children, but chills and chilly sensations are comparatively rare. Headache, nausea, anorexia, and vomiting are frequent early symptoms. The temperature rapidly rises to 103° or even to 105° F., and remains high until the eruption has reached its acme. The pulse is rapid, full and strong. The throat is at first dry, but later becomes congested, raw and exceedingly tender. The buccal mucosa may ex-

hibit a punctate redness, similar to that of the skin. The tongue is at first furred, but later desquamates, and assumes a peculiar strawberry appearance, due to papillary congestion. The eruption, which is at first diffuse and punctiform, generally appears on the second day of the disease. The neck and chest are usually involved primarily, although the rash rapidly spreads to other parts of the body. Only the circumoral region is ordinarily exempt. The eruption does not reach its fullest development until the end of the third or fourth day. At that time it consists of closely aggregated, pinhead-sized, or larger, reddish macules which give to the skin a distinctly scarlet color. The redness disappears on pressure, and when the skin is stroked with the finger nail, or a pointed instrument, long,

Fig. 255.—Desquamation after scarlet fever. (After Welch and Schamberg.)

transient, white streaks are formed. Minute hemorrhagic puncta are not uncommon, and crops of papules and vesicles sometimes develop, particularly in the region of the anterior axillary folds. Lymph-node involvement is the rule, and in severe cases, suppuration of the cervical glands is a not infrequent complication. Sloughing of the soft palate is also occasionally noted. In malignant types of the disorder the primary intoxication may be of so grave a character that death sometimes occurs within a few hours after the onset of the disease. In the milder and abortive types the eruption may be very slight, or even entirely lacking *(scarlatina sine eruptione)*. In rare instances, relapses or recurrences may prolong the disease over a period of several weeks, but as a rule desquamation commences at

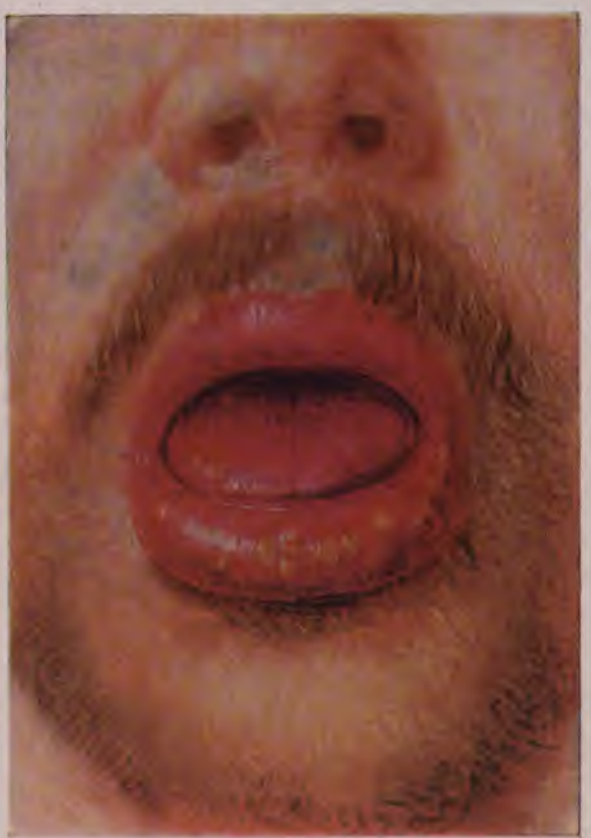

PLATE II.

Foot-and-Mouth Disease in Man. The color, size, and distribution of the vesicles are typical. (Courtesy of Dr. Paul W. Clough.)

some time between the seventh to the tenth day, and continues for a fortnight to a month. Its intensity is largely dependent upon the general character of the preceding eruption. The skin covering the flexor surfaces of the hands and feet is exfoliated most slowly, and may come away in the form of veritable casts of the affected parts. The nails are sometimes lost, but the hair is seldom shed. On other parts of the body exfoliation occurs in fine or coarse flakes and scales.

The most frequent complications are nephritis (during or following the attack), otitis media (often with resulting deafness), mastoiditis, and cardiac involvement (particularly endocarditis).

Diagnosis.—Scarlet fever may be confused with erythema scarlatinoides, drug rashes, and rubeola.

In erythema scarlatinoides the eruption is rarely generalized, and the constitutional symptoms, the angina, and the strawberry tongue

Fig. 256.—Desquamation following scarlet fever. (Courtesy of Dr. Howard Fox.)

of scarlatina are lacking. The efflorescence develops more slowly, and is of longer duration than that of scarlet fever. In drug rashes the history, together with the absence of fever and other manifestations of constitutional involvement, will serve as differential points. Rubeola is characterized by its longer period of incubation, the primary involvement of the forehead and face, the larger size, crescentric arrangement and darker color of the macules, the catarrhal involvement of the respiratory tract, and the comparatively slight constitutional symptoms.

RUBEOLA.

Synonyms.—Morbilli; Measles.

Definition.—An acute, contagious, febrile disease characterized by

catarrhal involvement of the upper respiratory tract, and a diffuse macular eruption which ends in desquamation.

Symptoms.—The incubation period of measles is fairly uniform, and varies from ten days to two weeks. The onset of the disease is gradual, and the earlier symptoms may be those of an ordinary cold—slight fever, headache, chilliness, coryza, lachrymation, sneezing, and cough. Photophobia also is often present. The appearance of the eruption may usually be noted first on the buccal mucosa, as small, irregular, bright-red spots, each of which is marked centrally by a minute, bluish-white speck (Koplik's spots). The cutaneous eruption, which consists of small, reddish, slightly elevated maculopapules, appears first on the face and forehead and then spreads rapidly to the trunk and extremities. On the abdomen and back the lesions often tend to form crescentric or segmental patches, which are partially or completely surrounded by normal skin. The eruption is of a deeper, darker red than that occurring in scarlatina. The peculiar, shotty lesions of variola are never present. The fever and the catarrh persist until the eruption begins to regress. In severe cases, petechiae may develop, or even extravasation of blood into the lesions may occur *(hemorrhagic measles)*. After the eruption has persisted for four or five days it gradually disappears, to be slowly followed by slight, furfuraceous, branny desquamation. Serious complications are infrequent. Bronchitis and broncho-pneumonia sometimes develop, particularly in frail or debilitated children, and otitis media, ulcerative stomatitis, and canerum oris occasionally occur.

Diagnosis.—Rubeola may be confused with variola; scarlatina and rubella. The differential diagnosis will be found under those various diseases.

RUBELLA.

Synonyms.—Rötheln; German measles.

Definition.—An acute, contagious, febrile disorder resembling rubeola, but relatively milder in character, and of somewhat shorter duration.

Symptoms.—The period of incubation is variable, from five days to three weeks. The onset is rather abrupt, and is characterized by symptoms of mild constitutional involvement, usually with associated enlargement of the postauricular, suboccipital and postcervical lymphnodes. The eruption, which consists of rounded or oval, pin-

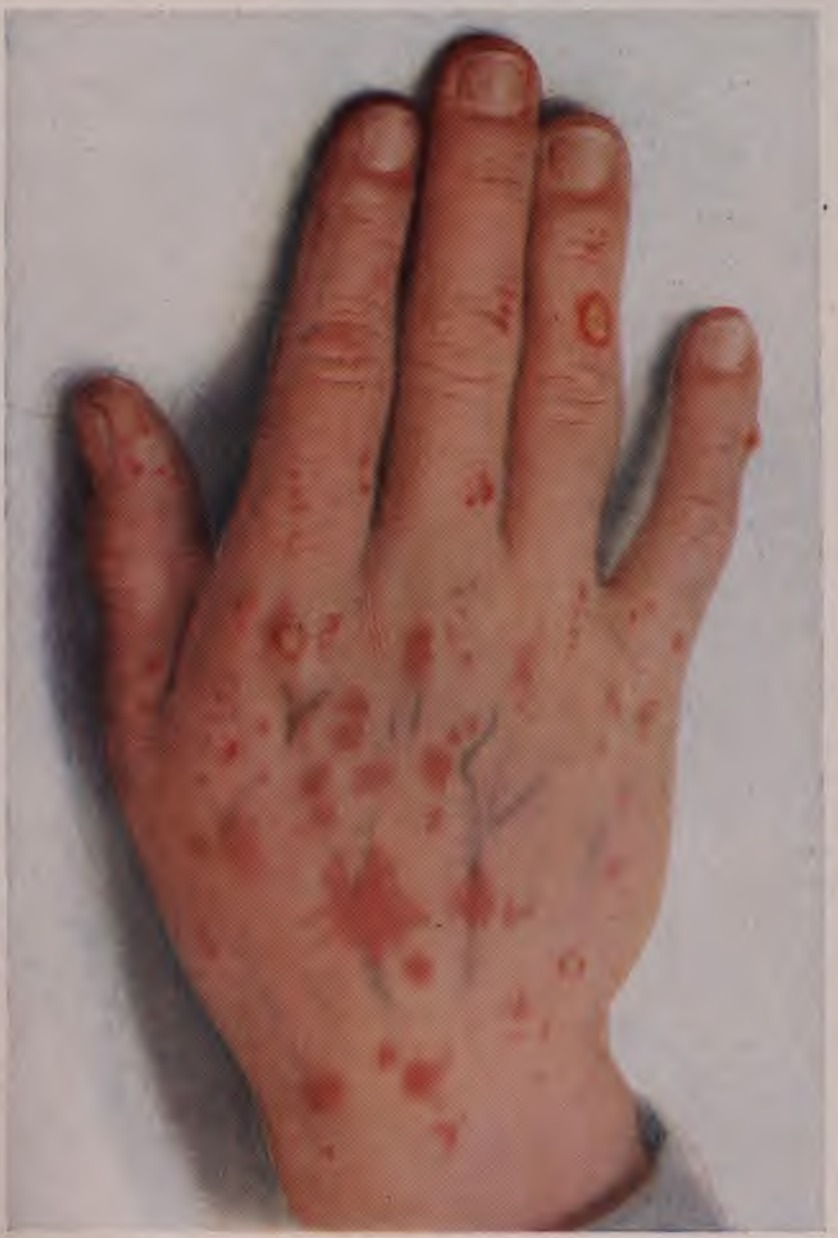

PLATE III.

Foot-and-Mouth Disease in Man, showing character and distribution of lesions on the hands. (Courtesy of Dr. Paul W. Clough.)

head- to split-pea-sized, pinkish macules or maculopapules, usually appears first on the face, but quickly spreads to the chest, trunk, and limbs. The lesions are usually discrete, but may be grouped, or even confluent. The rash seldom persists longer than three or four days, and its appearance is not followed by desquamation. Catarrhal symptoms, if present, are relatively mild. The patient's temperature seldom goes above 100° F., and in many instances there is no accompanying fever whatever. Relapses are infrequent, and one attack commonly immunizes.

Diagnosis.—The disease is to be differentiated from scarlatina, rubeola, and dermatitis medicamentosa. From the former it is to be recognized by its longer period of incubation, the absence of severe systemic symptoms, particularly fever and angina, the primary occurrence of the lesions on the face and forehead, the presence of slight catarrhal involvement of the respiratory tract, and the absence of desquamation and of serious complications. The pinkish, evanescent character of the lesions, the relatively mild nature or total absence of the respiratory symptoms, and the absence of cervical lymphnode enlargement will usually serve to distinguish it from rubeola.

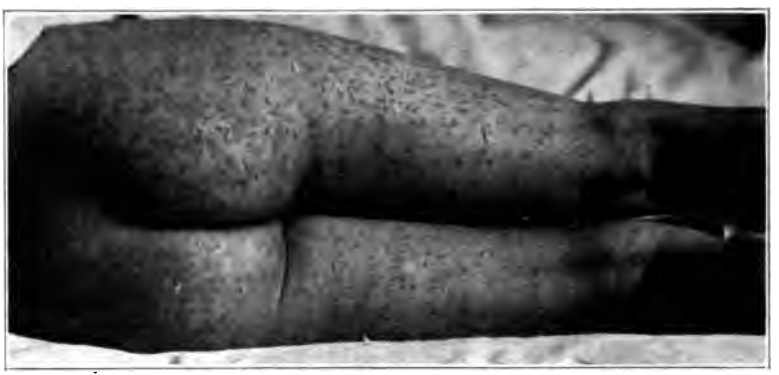

Fig. 257. Morbilliform type of rubella. (Courtesy of Dr. Jay F. Schamberg.)

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RUBELLA.—*J. P. Crozier Griffith*, Med. Record, New York, 1887, xxii, pp. 11 and 37; also in Loomis' System, 1897, i, p. 639; and Phila. Med. Jour., 1902, ix, p. 659.

FOOT-AND-MOUTH DISEASE IN MAN.

Foot-and-mouth disease is a systemic, epizoötic disorder of cattle, hogs, sheep, goats, and other animals. Man is occasionally attacked. The malady is infectious, the virus being present in the fluid of the

vesicles. Inoculation occurs through abrasions of the skin and mucous membranes, and may follow the ingestion of contaminated milk (Hertwig).

In man the incubation period varies from two to five or even ten days. An attack is usually ushered in by constitutional symptoms of moderate severity, with a feeling of dryness and burning in the mouth. The buccal mucosa membrane becomes congested and swollen. In the course of two or three days small vesicles develop on the lips, tongue, and pharyngeal walls. With the appearance of the exanthem, the manifestations of constitutional disturbance gradually subside. At the end of forty-eight or seventy-two hours the vesicles rupture spontaneously, leaving reddish, extremely tender ulcers, which heal promptly with little or no scarring. The individual lesions are from 3 to 10 mm. in diameter, and at first contain clear, watery fluid. Secondary pyogenic involvement, however, is not uncommon. The regional lymphnodes are swollen and tender.

In severe forms of the malady the extremities may be attacked, the hands being affected oftener than the feet. Rarely the eruption may be of generalized distribution. The cutaneous lesions pursue the same course as those located on the mucous membranes.

Fatal cases have been reported in severe epidemics of the disease, but as a rule the disease in man pursues a relatively mild course. The clinical picture is that of "a mild febrile infectious disease, characterized by the appearance of an erythema and a superficial vesicular eruption over the mucous membrane of the mouth and on the skin of the hands and feet; by salivation; by swelling, burning, and paresthesia of the affected parts, with subsequent desquamation; and by the healing of the ulcers without scar formation" (Clough).

The course of the malady is self-limited, and the treatment is symptomatic. Mild antiseptic and astringent washes, as aqueous solutions of potassium chlorate, alum, and similar remedies, may be employed to combat the buccal lesions. In a severe case of the disease seen in consultation with Dr. Alfred O'Donnell, of Ellsworth, Kansas, an aqueous solution of argyrol (20 per cent) proved valuable in the treatment of lesions of the mucous surfaces. On the general surface, calamine lotion, to be followed by zinc oil, or weak ammoniated mercurial ointment will hasten the disappearance of the eruption.

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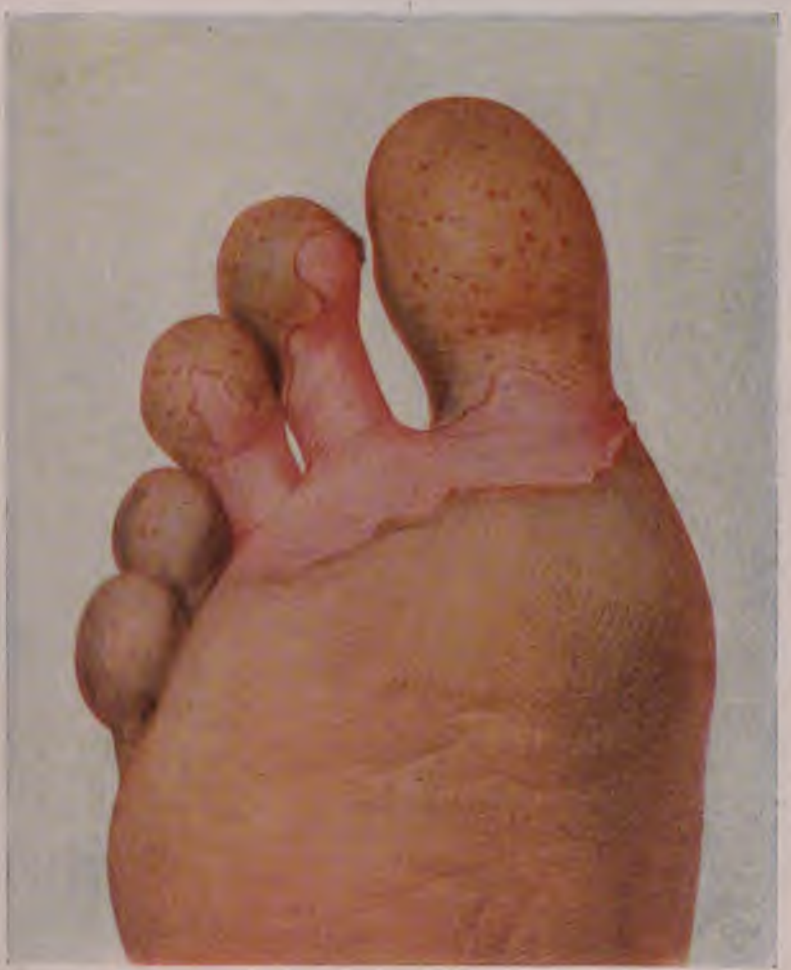

PLATE IV.

Foot-and-Mouth Disease in Man, showing desquamation in late stage of disease. (Courtesy of Dr. Paul W. Clough.)

CLASS III.—HEMORRHAGES.

PURPURA.

Synonym.—Hæmorrhœa petechialis.

Definition.—A disorder characterized by the occurrence of spontaneous hemorrhages in and beneath the skin and mucous membranes, with the resulting formation of reddish or purplish macules of various sizes and shapes. The term "purpura" is often employed solely in a symptomatic sense, in fact Mackenzie and other well recognized authorities have denied the existence of the condition as an essential disease.

Symptoms.—The character of the eruption differs somewhat in the various types of the disorder, and for this reason it is advisable to adhere to the old clinical terms until our knowledge of the etiology and pathology of the purpuras in general is sufficiently complete to permit of the adoption of a rational classification.

Purpura Simplex.—This type is commonest in the fourth decade of life, and an attack generally lasts from four to eight weeks. Occasionally the attack is ushered in by fever of slight degree, nausea, and vomiting, but usually manifestations of constitutional disturbance are entirely wanting. In a series of thirty-four cases, Pratt found albumin present in the urine in three instances. The spots are small, oval or circular in outline, and symmetrically distributed. The sites of predilection are the legs and arms. Subjective symptoms are absent.

Purpura Rheumatica.—This variety, the "*peliosis rheumatica*" of Schönlein, is simply purpura simplex with associated arthritis. Purpura is often associated with urticaria and angioneurotic edema, and even more frequently with erythema multiforme. Osler has clearly demonstrated the close affinity that exists between exudative erythema, Henoch's purpura, and angioneurotic edema (Pratt).

Henoch's Purpura.—This variety, which concerns the internist more than it does the dermatologist, is a disease of early life, and is characterized by recurrent attacks of purpura, accompanied by the vomiting of blood and the passage of bloody stools. The onset is usually afebrile, but is accompanied by abdominal colic, and severe

pains in one or more joints. Nephritis is a frequent complication, and hematuria is sometimes present.

Purpura Hemorrhagica.—In this form the onset is abrupt and severe, and there is profuse hemorrhage from the mucous membranes of the nose, and the gums and other parts of the mouth, as well as

Fig. 258.—Purpura simplex.

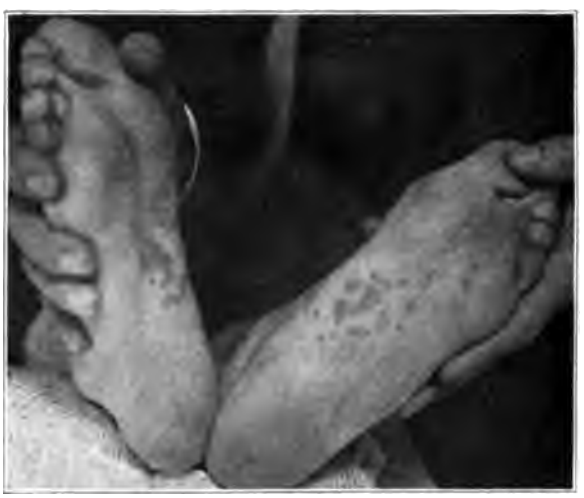

Fig. 259.—Purpura of the soles.

from the intestines, stomach, uterus, and genitourinary tract. The cutaneous involvement may be very extensive. The average duration of purpura hemorrhagica is from four to ten weeks, although chronic cases persisting for many years have been reported. As a

rule there is little or no elevation of temperature. Arthritis is a common accompaniment, and as in Henoch's purpura acute nephritis is a not unusual, and is always a very serious, complication.

Purpura Fulminans.—In this variety, which is exceedingly rare, the involvement is rapid and extensive. There is no bleeding from

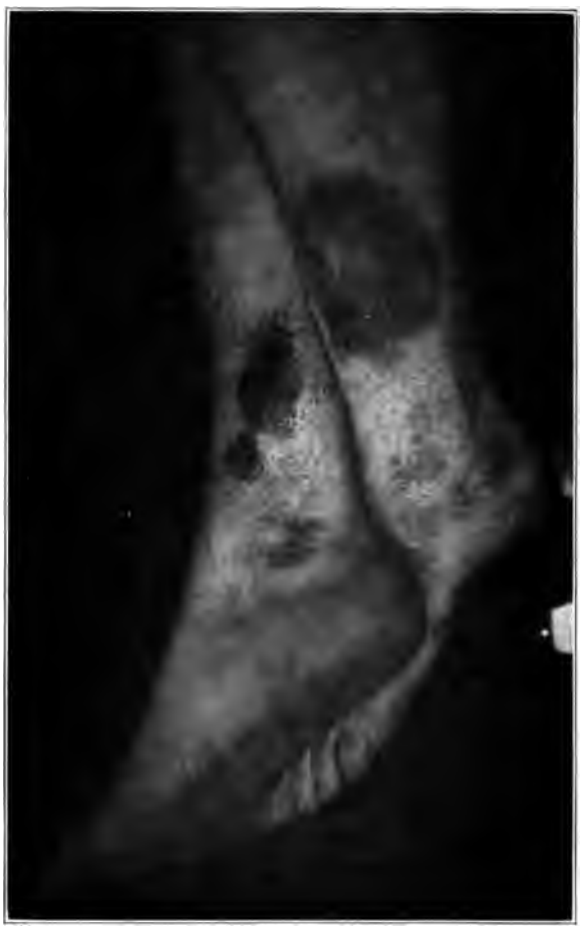

Fig. 260.—Purpura rheumatica.

the mucous membranes. The disorder sometimes develops following scarlet fever. The majority of the few reported cases have occurred in children, and invariably the disease is rapidly fatal.

Chronic Purpura.—There are two chronic varieties of the disease, a continuous form in which the cutaneous hemorrhages may persist

uninterruptedly for months or years, and an intermittent form in which the attacks are separated by quiescent periods in which the skin and mucous membranes are apparently normal.

From an etiologic standpoint, purpura may be secondary (symptomatic) or primary (idiopathic). Under symptomatic purpura Pratt places:

Purpura in Acute Infectious Diseases.—Cutaneous hemorrhages of this type may occur in typhus fever, cerebrospinal fever, typhoid fever, scarlet fever, measles, and particularly in smallpox, during the early stages of the disease. Occasionally it develops following vaccination.

Purpura in Chronic Disturbances of Nutrition.—This form of the malady is sometimes designated as cachectic purpura, and may develop

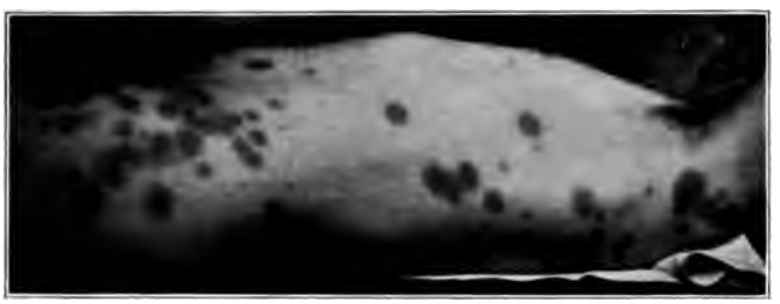

Fig. 261.—Toxic purpura.

in chronic nephritis, heart disease, pernicious anemia, icterus gravis, tuberculosis, leukemia, particularly lymphatic leukemia, and other constitutional disorders.

Senile Purpura.—This variety, which occurs in elderly individuals, commonly affects the legs, arms, and backs of the hands. It is usually observed in association with feeble or obstructed venous circulation, and is comparatively mild in its character and course.

Toxic Purpura.—Of the various toxic agents which may give rise to manifestations of purpura, iodine and the iodides, snake venom, mercury, antipyrine, chloral hydrate, copaiba, quinine, ergot, turpentine, belladonna, and the salicylates are the most common.

Nervous Purpura.—Purpuric spots may develop as a result of severe fright, and also possibly as a result of various neuropathic influences.

Mechanical Purpura.—In susceptible individuals petechial lesions may appear following slight trauma, or even as a result of gravity (the *purpura orthostatique* of Archard and Grenet).

Idiopathic or Primary Purpura (Morbus Maculosus).—In this type the diagnosis can be made only by exclusion. There may be associated arthritic manifestations (constituting the so-called "purpura rheumatica"), hemorrhage from the mucous membranes (purpura hemorrhagica), or crises of abdominal pain, with accompanying vomiting and diarrhea—both vomitus and stools containing blood (Henoch's purpura, or purpura abdominalis).

Etiology and Pathology.—In symptomatic purpura it is probable that the vessel walls are affected by some toxin in the circulating blood, but both the exact nature of the toxin, and the character and degree of the vascular alteration are matters of conjecture. Microorganisms, particularly streptococci, have repeatedly been found in purpuras of the secondary type, and it is probable, as Henry Jackson suggests, that the causative factors in this type may be separated into several classes—vasomotor, toxic, and infectious.

In the primary, or idiopathic, type, however, the bacteriological findings have been uniformly negative, and we must seek further for a probable cause of the pathologic changes which occur.

In purpura hemorrhagica Denys, Hayem, Pratt, Duke, and others have found a much reduced platelet count (sometimes running only 2,500 per cm., the normal count being 470,000). Duke reduced the platelet count in rabbits by the injection of benzol, and noted the development of petechiae on the ears of the animals twenty-four hours later. There is no retraction of the clot as in normal blood, and Duke found the bleeding time greatly prolonged, a peculiarity which was not present in simple purpura, Henoch's purpura, and scurvy.

Diagnosis.—The non-inflammatory, sharply defined, painless character of the lesions, together with their color and the fact that they do not disappear under pressure, should prevent confusion. Scurvy must be differentiated at times, but in this disorder the history, the involvement of the gums, and the tendency of the cutaneous lesions to break down and ulcerate, all are distinctive.

Prognosis.—The prognosis is dependent upon the type of purpura present, and, to a certain extent, on the general physical condition of the patient. All excepting the fulminating and hemorrhagic cases generally recover.

Treatment.—Absolute rest in bed is essential in all except the very mildest cases. The patient should be handled gently, and the slightest pressure or trauma avoided. Of the various internal remedies advised none is specific. Aromatic sulphuric acid, in doses of M 15 - 30 (1 to 2 cc.), largely diluted, may be tried, and calcium chloride and calcium lactate have been recommended on theoretical grounds. Both Osler and Crocker speak highly of oil of turpentine. In those cases complicated with arthritis, the salicylates should be tried (Frick). Injections of artificial serum sometimes prove beneficial, and Duke highly recommends direct transfusion of blood in severe cases of purpura hemorrhagica.

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PURPURA.—*Pratt*, in Osler and McCrae's System of Modern Medicine, Phila. and New York, 1915, p. 687. (In the preparation of this section I am largely indebted to this valuable and exhaustive contribution). — *Stephen Mackenzie*, in Allbutt's System of Medicine, 1898, v, p. 568. — *Osler*, Jacobi's Festschrift, New York, 1900, p. 459. — *Knowles*, Am. Med., 1908, p. 30 (scurvy); Idem, Jour. A. M. A., July 9, 1910, lv, p. 100 (iodides). — *Fischkin*, Illinois Med. Jour., 1903, N. S., p. 844. — *Henry Jackson*, Tr. Am. Ped. Soc., 1890, p. 158. — *Duke*, Arch. Int. Med., 1912, x, p. 445; Ibid., Bull. Johns Hopkins Hosp., 1912, p. 144 (two exceedingly valuable original papers). — *J. S. Wilson*, Med. Record, New York, 1912, lxxxii, p. 249 (Henoch's purpura treated with human blood serum,—recovery).

PURPURA ANNULARIS TELANGIECTODES.

Synonym.—Majocchi's disease.

This is a rare type of purpura characterized clinically by the development of minute, sharply defined, rose or red colored macules composed of dilated capillaries, symmetrically distributed over the legs and dorsal surfaces of the feet, and occasionally on the thighs, forearms, and trunk. This primary or telangiectatic stage is followed by the appearance of tiny, dark-red puncta which appear throughout the lesions, but particularly at their margins. The lesions slowly enlarge peripherally until they attain a diameter of one or two centimeters, gradually clearing in the center, so that circinate formations are produced. These annular lesions may coalesce, giving rise to gyrate or segmental patches. The central portion of the lesions is generally pigmented brown, the margins being reddish or punctate. Ultimately, after a comparatively quiescent period of several weeks or months, involution, usually accompanied by atrophy and hair loss, takes place.

Histologically, the most characteristic feature is an obliterative endarteritis of the vessels in the deep reticular layer and in the hypoderm, with moderate round cell infiltration. Both arteries and

Fig. 262.—Majocchi's disease, in a young man. (Courtesy of Dr. Frederick G. Harris.)

veins are involved. In the later stages the papillae are obliterated, and the skin glands undergo atrophic changes.

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CLASS IV.—HYPERTROPHIES.

ICHTHYOSIS.

Synonyms.—Fish-skin disease; Alligator-skin disease; Xeroderma; Xerosis; Sauriasis.

Definition.—A congenital abnormality of the skin, characterized by dryness, harshness, scaliness and other manifestations of irregular hypercornification.

Symptoms.—Ichthyosis is a fairly common condition. The disorder is solely cutaneous, and varies considerably in distribution and in degree of severity. The general health is unaffected. In the milder type (xeroderma) the extensor surfaces of the limbs are the sites of predilection, although the entire body may be involved. The integument may appear thick, leathery, and inelastic. During the warmer months, when the skin is moist and well lubricated, the lesions are scarcely perceptible, but on the approach of fall, with its cold, dry winds, they become rough, harsh and scaly. The follicular keratosis may give rise to the formation of peculiar, spinous, nutmeg-grater-like lesions at the pilosebaceous orifices *(keratosis pilaris)*. The dry, harsh skin is exceedingly susceptible to irritation from any source, and xerodermatous individuals are not infrequent sufferers from eczema and kindred ailments.

As a rule the condition is noticeable at, or shortly following, birth. In the more pronounced examples, the thickening, roughness and scaliness all are exaggerated, and the hair covering scalp and eyebrows becomes dry and loses its luster, and becomes somewhat sparse, and, as a result of lessened elasticity and flexibility, fissures may develop in the natural folds of the skin. In some instances the affected skin is extraordinarily susceptible to the effects of even slight irritation (the "ichthyosis irritable" of Besnier). Both the sebaceous and coil gland secretions are deficient. The desquamated material is branny in character, and often contains considerable amounts of sebum and oil. The involvement is more pronounced on the areas where the skin is normally thick and stationary. Subjective symptoms are, as a rule, slight, or entirely lacking. The condition may be pronounced in character at birth, occasionally to such a degree that the affected infant, which

is sometimes referred to as a "harlequin fetus," is a most pitiable object. Fortunately the majority of the victims die, either at birth

Fig. 263.—Ichthyosis, in a boy aged 12. (Courtesy of Dr. H. C. Sumney and Dr. J. W. Hellwig.)

or shortly afterward. In a case under my own care, through the courtesy of Dr. J. W. Faust, of Kansas City, Kansas, the skin was so lacking in suppleness and elasticity that fissures devel-

oped on the trunk and at the buccal commissures as a result of even moderate movement, and up to the end of its first year the child was at no time free from lesions of this character. Ectropion, puckering of the mouth, and distortion of the ears likewise were present. The

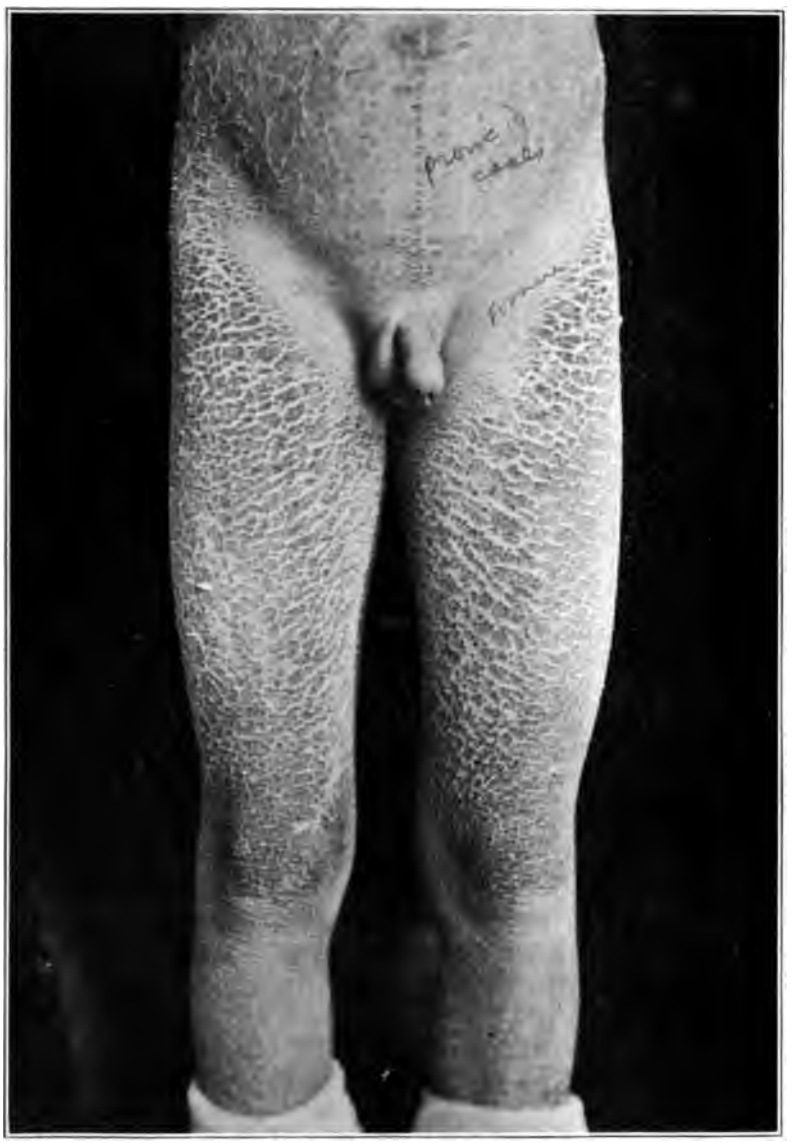

Fig. 264.—Ichthyosis. (Dr. Geo. P. Lingerfelter's patient.)

skin on the body was smooth, dry, and hard, and the color of flexible collodion. Hebra and Kaposi believed that cases of this type were instances of generalized seborrhea, but their opinion was based on clinical and not on histological evidence.

Examples of acquired ichthyosis are exceedingly rare, but undoubtedly do occur. Crocker, Tommasoli, and others have reported cases. I once had an opportunity to study an acquired case in a youth of 17. The condition developed following an attack of typhoid fever, and only certain symmetrically distributed areas were affected. When the patient sweated profusely on other parts of the body

Fig. 265.—Ichthyosis.

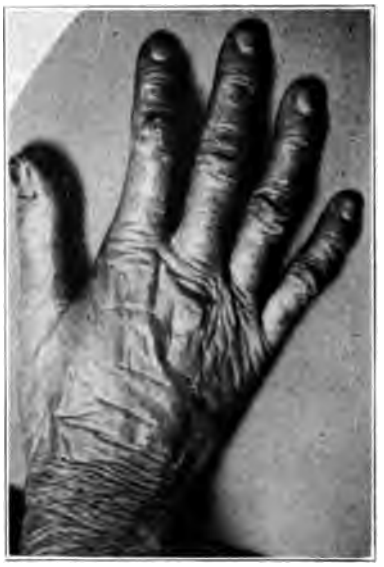

Fig. 266.—Ichthyosis.

these surfaces remained perfectly dry. Histologically the skin was identical with that found in well marked cases of xeroderma. Crocker states that the piper methysticum chewers of the Sandwich Islands oftentimes develop the condition, and Ballet and Dutil have noted its occurrence in tabetics. Unna would place these acquired types of ichthyosis in the class of stagnation keratoses, and it is probable that his explanation is the correct one, at least in some of the cases.

Erythrodermia Congenitale Ichthyosiforme is a variety of ichthyosis in which the skin is thickened, and presents a shiny, reddened, varnished appearance, with a tendency to lichenification in the vicinity of the

larger joints. The condition has been studied and described by Brocq in France, Jadassohn in Switzerland, Pernet in England, and Fordyce, MacKee, Remer, and others in this country. A typical example was exhibited by Varney, at the Detroit meeting of the American Medical Association, in 1916. In an extremely interesting case of congenital ichthyosis reported by Burns, the affection bore a marked resemblance to those

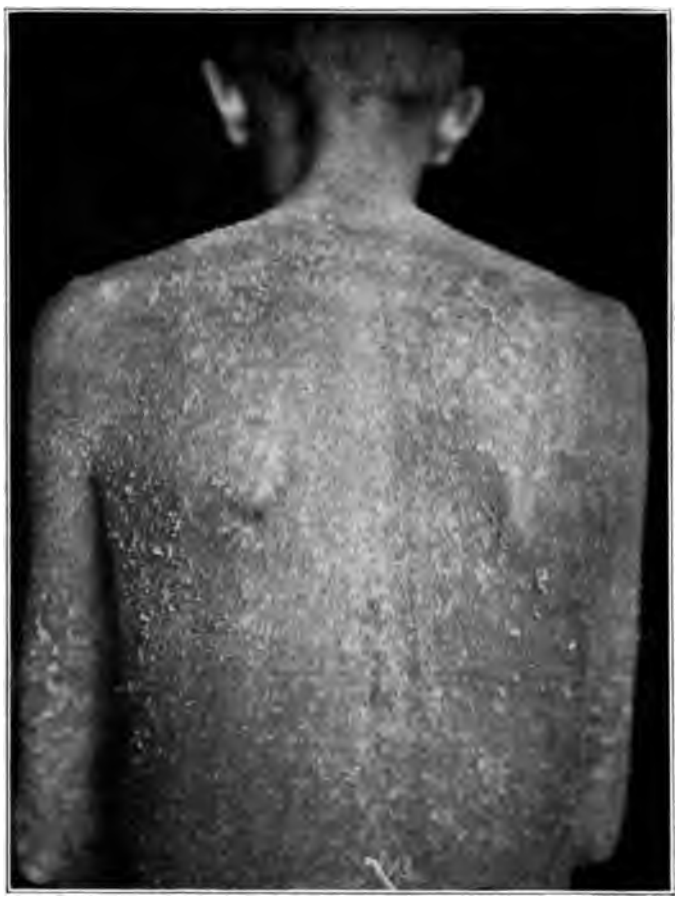

Fig. 267.—Ichthyosis, in a young man.

described by Brocq, but in addition there was present buccal and nasal involvement, and the eyes and ears also were affected.

Etiology.—In the vast majority of instances the disorder is a congenital one. A hereditary tendency to the condition has been repeatedly noted by careful observers (Frick). Bowen's suggestion

that the condition is a result of persistence of the embryonic epidermis (epitrichium) is very probably correct. Hypothyroidism and various toxic conditions, particularly such as affect the nervous

Fig. 268.—Ichthyosis. (Dr. Geo. P. Lingenfelter's patient.)

system, possibly play a part in the etiology of the acquired cases.

Pathology.—The primary changes are, in all probability, dermal.

The horny layer is thickened (without apparent parakeratosis), the prickle layer is thinned, and the stratum granulosum absent. The papillae are narrow and elongated ("alpine papillae"), and the cells comprising the basal layer of the rete are flatter and less definitely arranged than normal. The hyperkeratosis tends to occlude the sebaceous and coil gland orifices, but is of insufficient degree to give rise to papulation. The sweat ducts and acini are usually dilated, and Audry found atrophy of the sebaceous glands.

Diagnosis.—The history, the character and the distribution of the lesions, and the absence of inflammatory and subjective symptoms, all are distinctive. The occasional presence of possible complications, particularly eczema, must always be borne in mind.

Fig. 269.—Ichthyosis of extreme degree. (Courtesy of Dr. J. Wesley Faust.)

Prognosis.—Many of the milder cases usually clear up with adolescence. In the more severe types, permanent cure is not possible, but temporary amelioration can generally be safely promised.

Treatment.—Of the many internal remedies that have been recommended, pilocarpine and thyroid extract are the most dependable. Both must be employed with circumspection. Locally, frequent inunction with a bland oil, such as cocoa butter, petrolatum, oil of

sweet almonds, or benzoinated lard, is the most helpful and comforting. A small proportion (2 to 5 per cent) of salicylic acid can often be advantageously added. These applications act best when applied immediately following a hot bath. Soft water, containing bran or a mild alkali (borax or sodium carbonate), should be employed for this purpose.

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ICHTHYOSIS HYSTRIX.

Ichthyosis hystrix is a term commonly applied to a peculiar type of giant nævus which involves large areas on the trunk and limbs, and is characterized by thick, horny, hypertrophic papillary elevations. The warty projections vary considerably in diameter and in

Fig. 270.—Ichthyosis hystrix.

length. In extreme instances they may impart to the affected areas a porcupine-like appearance. The less pronounced examples often resemble patches of ichthyosis simplex. The skin is dry, the nails often friable, and the hair dry and lusterless. The face, palms and soles are occasionally spared. Subjective symptoms are absent.

A linear type of ichthyosis hystrix has been described under various names such as *nævus verrucosus,* and *nævus neuroticus unius lateralis.* Histologically this form is indistinguishable from the more generalized variety. The occurrence of mixed types would indicate that ichthyosis simplex and ichthyosis hystrix are allied conditions.

Pathology.—There is enormous papillary hypertrophy, with accompanying increase in size of the intrapapillary vessels. The prickle layer is comparatively thin throughout the affected areas. In consequence, the hyperplastic stratum corneum dips down into the

Fig. 271.—Ichthyosis hystrix. The patient's two children are also affected with the disorder.

interpapillary depressions, giving rise to the peculiar spinous projections which are so characteristic of the condition. The governing factor in the distribution of the linear cases is a mooted question. D. W. Montgomery, who has contributed an admirable article on the subject, concludes that the streaks probably are due to the streams or trend of growth of the tissues and to the adaptation of the embryonic sutures.

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Ichthyosis Hystrix.– *Chas. J. White,* Jour. Cutan. Dis., 1912, p. 293.

ACANTHOSIS NIGRICANS.

Synonym.—Keratosis nigricans.

Definition.—A chronic inflammatory disease which in adult life is generally associated with cancer of some internal organ, and is characterized by hard and soft papillary growths which are symmetrically distributed and are accompanied by pigmentation and hyperkeratosis.

Fig. 272.—Acanthosis nigricans, showing involvement of eyelids and lips. (Courtesy of Dr. A. J. Markley.)

Symptoms.—The disease is a comparatively rare one, and was first described by Pollitzer and Janovsky in 1890. The mode of onset is variable, and the cutaneous lesions may develop slowly and insidiously or rapidly. The flexures and the face, lips, mouth and nipples are the sites of predilection, although no region is exempt. The earliest manifestations are usually pigmentary in character, the affected skin assuming a reddish, brownish or blackish hue which gradually

fades off at the margin of the lesions. The epidermis becomes thickened, but without accompanying induration, and the natural lines

Fig. 273.—Acanthosis nigricans, involving the lips. (Courtesy of Dr. William Frick.)

Fig. 274.—Acanthosis nigricans. (Courtesy of Dr. William Frick.)

of the skin are exaggerated. These changes are followed by the development of numerous soft, millet-seed- to pea-sized, papillary growths. These little tumors are particularly abundant in the axil-

lary, vaginal, and crural regions, and at the mouths of the cutaneous orifices, and are often accompanied by crops of apparently common warts which are distributed irregularly over the hands, forearms, and thighs. There is generally more or less associated hair loss, particularly of the scalp and eyebrows, and the nails are usually striated and brittle. Hyperkeratosis of the palms and soles is a common accompaniment. The mucous membranes may escape, but are commonly involved to some extent. The buccal mucosa may be thickened and velvety, or it may have a granular appearance, or be the site of numerous small, papillomatous growths. In Pollitzer's

Fig. 275.—Acanthosis nigricans. (Courtesy of Dr. William Frick.)

case the tongue was fissured and condylomatous, and in one of Crocker's patients it looked as if coated with bluish-white paint. In a few cases there has been general lymphnode enlargement.

Etiology.—The cause of acanthosis nigricans is not known. In the majority of instances there has been associated cancerous involvement of some internal organ, usually the stomach, liver or uterus. In Janovsky's case the disorder was ascribed to exposure to excessive heat, and Crocker believed that exposure to great cold was the principal etiologic factor in one of his cases. Couillaud considers the disorder a syndrome dependent upon carcinomatous disease of

the abdominal organs, and Pollitzer, in his most recent communication, expresses the belief that the condition is a symptom of some disorder of the abdominal sympathetic. Inasmuch as the majority of the younger victims of the disease have not been sufferers from in-

Fig. 276.—Acanthosis nigricans, showing characteristic histologic changes. Low magnification. (Courtesy of Dr. Charles J. White.)

ternal cancer, Pollitzer's explanation is at present the most acceptable one of the two. Wise has reported an interesting case which developed following decapsulation of the kidneys.

Pathology.—The papillary hypertrophy varies with the character and stage of the lesions, but is usually considerable. The blood and lymph vessels are dilated, and there is some cellular infiltration, with many mast and pigment cells. The prickle layer is greatly thickened, and contains an abnormal amount of brown pigment. The intercellular spaces are widened, and contain a few leucocytes. The stratum granulosum likewise is increased in depth, and there is considerable thickening of the upper horny layers.

Prognosis.—The outlook is dependent upon the presence or absence of an underlying carcinomatous factor. In the uncomplicated cases the prognosis, insofar as life is concerned, is fairly good.

Treatment.—The treatment is empirical, and purely symptomatic. White found thyroid extract of some service.

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CLAVUS.

Synonym.—Corn.

Definition.—A circumscribed, slightly elevated, cone-shaped hypertrophy of the horny layer with its apex pointing inward and lying in close proximity to the papillae.

Symptoms.—Corns are usually seated on the toes and at other points where the skin is exposed to friction and pressure. They are generally smaller and more sharply circumscribed than callosities, from which they are distinguished by the presence of a horny core, or tap, the lower end of which lies in close apposition to the tender, sensitive cutis. They may be spontaneously painful, but commonly give rise to disagreeable subjective symptoms only upon manipulation. Corns may be hard or soft, according to their location and the nature of their environment. Hard corns occur on exposed surfaces, and their tops are rounded, smooth and burnished. Soft corns develop, as a rule, between the toes, and as a result of maceration are soft and moist to the touch, and grayish in color. Following infection with the ordinary pyogenic organisms, either type may undergo suppuration, with more or less resultant ulceration. For this reason it

is essential that manicurists and chiropodists exercise cleanliness in dealing with lesions of this character.

Etiology.—Corns may arise spontaneously (Davies-Colley), but as a rule they are a result of pressure or friction, or both, from ill-fitting shoes.

Pathology.—At the base of the lesions the papillary bodies commonly are flattened, but surrounding the growth these dermal projections are enlarged, and their blood vessels are dilated. Occasionally a coil gland outlet is found winding its way upward through the keratotic mass, but in the majority of instances these canals exist only in the peripheral regions. The glands themselves are well preserved, although both the coils and ducts are usually dilated. The central portion of the lesion consists of compressed horny material, and is conical in form, with the point projecting downward. The subjacent connective tissue is condensed, and the elastic fibers have completely disappeared.

In four cases of "soft" corn investigated by Chase, there was an irregular lymph channel leading to the underlying tendon sheath in every instance.

Treatment.—The essential point in the treatment is to remove the cause. In attempting this it is well to bear in mind that footwear which fits too loosely is as liable to cause trouble as footwear that is too tight. In the vast majority of instances, the adoption of broad toed, "foot-form" shoes, made of soft, elastic leather, will prove both prophylactic and curative. The lesions can readily be removed by the use of salicylic acid ointment (10 to 20 per cent) applied on a bit of cloth and surrounded by a ring of felt (a so-called corn or bunion "protector"), or the corneous plug can be dissolved by means of an aqueous solution of caustic potash (8 per cent), cautiously applied with a glass rod or a small swab (Duhring). Another excellent plan is to "block" off the affected part by the injection of a few drops of novocain or Schleich's solution at the base of the toe, and then carefully dissect out the offending mass with a sharp scalpel or a safety razor blade. The resultant cavity is then painted with tincture of iodine, and thymol iodide applied for a few days. The suppurative cases are best treated by excision, followed by the application of tincture of iodine, and, if necessary, prolonged immersion in a warm aqueous solution of lysol (1 per cent). Soft corns may be dissected out in the same manner, but in addition to the tincture

of iodine and thymol iodide, a small, clean cotton pad should be worn for several days in order to prevent maceration.

REFERENCE.

CLAVUS.—*Chase*, Boston Med. and Surg. Jour., clxxv, p. 134.

CALLOSITAS.

Synonyms.—Tylosis, Callus.

Definition.—A localized, hyperkeratotic patch, usually occurring as a result of long continued intermittent pressure and friction.

Symptoms.—Callosities are of various sizes, and are generally oval or elongated in outline. The sites of predilection are the flexor surfaces of the hands and feet. The lesions are yellowish, grayish or brownish in color and slightly elevated, with smooth, burnished surfaces. At the circumference they merge gradually into the adjoining normal skin. They are seen most frequently on the hands of mechanics (particularly blacksmiths and metal workers), stokers and oarsmen, and occasionally on the fingers of harp and violin players. In tropical countries, where the majority of the laboring class go unshod, the lesions are exceedingly common on the plantar surfaces of the feet. It is doubtful if they ever arise spontaneously.

Pathology.—The papillae are flattened, but seldom exhibit inflammatory changes. The prickle layer is thinned. The stratum granulosum is thickened. The horny layer is enormously hypertrophied, with more or less accompanying condensation.

Treatment.—The lesions seldom give rise to pain or discomfort. They can be temporarily removed by means of salicylic acid (20 per cent ointment), or caustic potash (10 per cent solution), or by carefully shaving off the upper layers with a scalpel or razor. Permanent relief can be secured only by the removal of the cause.

CORNU CUTANEUM.

Synonyms.—Cutaneous horn; Cornu humanum.

Definition.—A papillary, medullated, horny growth seated on a circumscribed, warty base.

Symptoms.—True cutaneous horns are rare, but the term cornu cutaneum is commonly applied also to various non-medullated, kerotic growths, which are comparatively common. The sites of predilection are the seborrheic regions of the skin—the scalp, the fore-

head, the nose, the eyelids, the glans penis, and the scrotum. Microscopically, human horns somewhat resemble those of animals, although they spring from a cutaneous and never from an osseous base. The surface may be smooth and polished, or rough, wrinkled and scaly.

Fig. 277.—Cutaneous horn. (Courtesy of Dr. J. B. Kessler.)

Fig. 278.—Cutaneous horn, natural size. (Courtesy of Dr. J. B. Kessler.)

Fig. 279.—Cutaneous horns of penis.

Fig. 280.—Cutaneous horns of penis.

The lesions vary considerably in outline, and may be conical or cylindrical, straight, twisted or angular. In color they may be yellowish, brownish, or blackish. Their bases are concave or flattened. Usually there are no accompanying signs of inflammation. The

growths may persist, or they may be shed spontaneously and not recur. In the majority of instances, however, they either recur, or the bases undergo degenerative changes and become carcinomatous.

Etiology.—The cause of cutaneous horns is not known. They sometimes spring from "warty" spots in the skin (in 27 out of 109 cases reported by Lebert), and from scars or sebaceous cysts. It is exceedingly probable that the verrucose type of seborrheic keratoses serves as the basis of a considerable percentage. Both sexes, and practically all ages are affected, although the lesions are commonest

Fig. 281.—Cutaneous horn of lip. (Courtesy of Dr. John W. Perkins.)

Fig. 282.—Cutaneous horn.

in elderly individuals. In my experience, persons who are frequently exposed to strong sunlight and to harsh winds are the most frequent victims of the disease.

Pathology.—True cutaneous horns always have one or more hypertrophied papillae for a base. The intrapapillary vessels are greatly increased in size. The interior of the horn consists of columns of anuclear corneous cells, arranged in concentric laminae, the interspaces being filled with horny wedges and homogeneous appearing masses of corneous substance.

Prognosis.—The lesions are easily removed, but are prone to re-

cur. A considerable number (12 per cent, according to Lebert) become carcinomatous.

Treatment.—Excision is the method of choice. Should this be refused, or if the location of the growth is such that the necessary tissue cannot well be spared, the horny mass can be dissolved off with caustic potash, and the base eradicated by means of the thermocautery. In the smaller growths, thorough freezing of the base with carbon dioxide snow is generally sufficient, and in one instance I

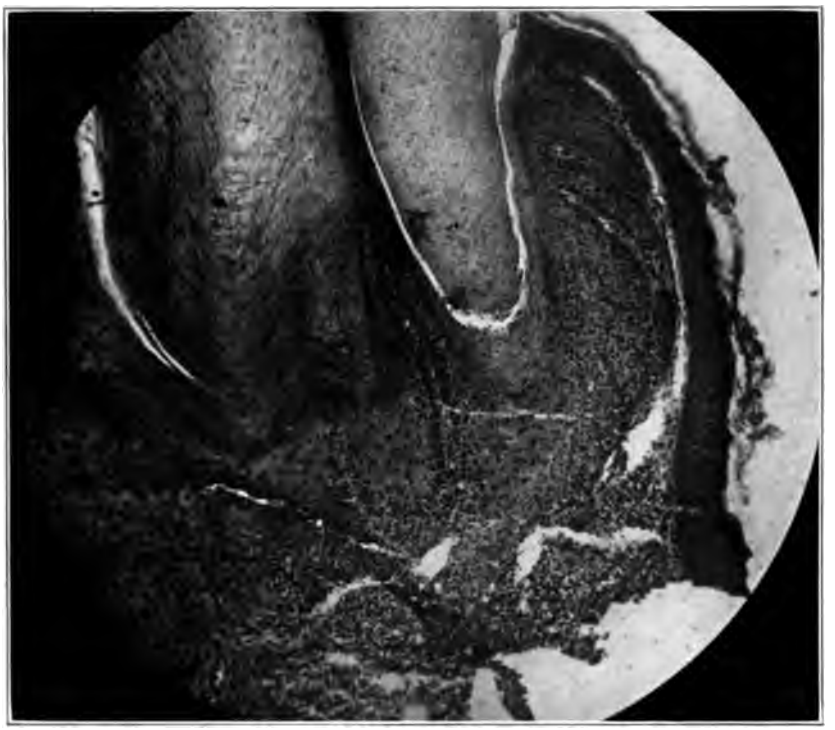

Fig. 283. A portion of the base of a small cutaneous horn from the penis, showing papillary formation, horny columns, sharply circumscribed acanthosis, and inflammatory changes in the derma. (Leitz, No. 3 obj., No. 4 eyepiece, 20 cm. bellows extension.)

have secured a most excellent cosmetic result from the application of radium.

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KERATOSIS GONORRHEICA.

Synonym.—Kératoses blennorrhagique.

Definition.—A chronic inflammatory disease of the skin, occurring in conjunction with gonorrheal infection of the genital tract or of the joints, and characterized by a symmetrical eruption of horny,

Fig. 284.—Keratosis gonorrheica. (Courtesy of Dr. Marcus Haase.)

Fig. 285.—Keratosis gonorrheica, typical involvement. (Courtesy of Dr. Marcus Haase.)

conical nodules, pustules and crusts on the palms and soles and other parts of the body.

Symptoms.—The disorder was first described by Vidal in 1893. Since then a score or more of cases have been reported from France, Germany, England, and the United States. Simpson was the first

to recognize and study the condition in this country, and I am largely indebted to his admirable paper for the following description: Buschke separates the eruptions observed in gonorrhea into four groups: (1) simple erythema not dependent upon medication; (2) urticarial and erythema nodosum lesions, sometimes with associated endocarditis and pericarditis; (3) hemorrhagic and bullous eruptions which are usually associated with evidences of gonococcic septicemia and are possibly embolic in origin; and (4) hyperkeratotic lesions which are probably specific, and which may be either generalized or localized. No region is exempt, but the sites of predilection are the internal plantar margins and the dorsum of the great toe.

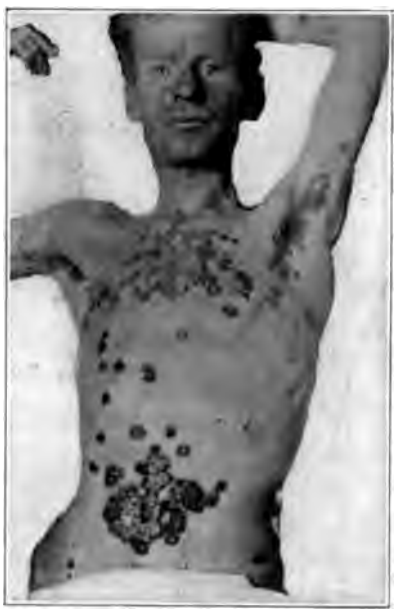

Fig. 286.—Keratosis gonorrheica. A rare type, showing lesions on trunk. (Courtesy of Dr. Marcus Haase.)

The mucous membranes are not involved. On the head, trunk and extremities the lesions are usually discrete, horn-like crusts, 0.2 to 3 cm. in diameter. On the flexor surfaces of the hands and feet the disorder gives rise to diffuse, frequently irregular, dirty, yellowish thickening of the epidermis, often with relief-map-like projections. Destruction or ulceration of the skin never occurs. The sites of former lesions are marked by a slight erythema or pigmentation which soon disappears. In a case recently under my care the lesions,

which were small, nodular and horny, were confined to the pubic and abdominal regions and had been present for almost a year. The patient was a young negress who had contracted gonorrhea seven months prior to the appearance of the eruption. There was no accompanying arthritis. Haase has described a very extraordinary case of the disorder in which the eruption involved the face, trunk, and extremities. In view of the pathological findings, he suggests for the condition the very appropriate designation of "Parakeratosis gonorrheica."

Etiology.—While the etiologic relationship of the gonorrheal in-

Fig. 287.—Blennorrhagic keratoses. (Courtesy of Dr. Frank Edward Simpson.)

fection to the eruption has not yet been proved, there is every reason to believe that such a relationship exists. In the case under my care Dr. John Ross Campbell recovered from some of the unruptured lesions diplococci which could not be differentiated from the gonococcus. As in Chauffard and Fiessinger's experiments, however, the injection of these organisms into normal skin did not result in the development of typical cutaneous lesions.

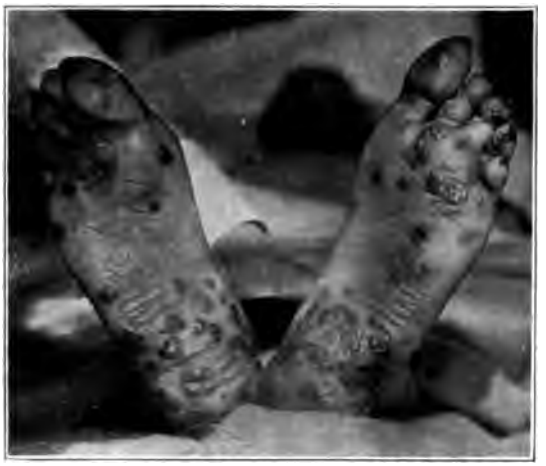

Fig. 288.—Blennorrhagic keratoses. (Courtesy of Dr. A. Winkelreid Williams)

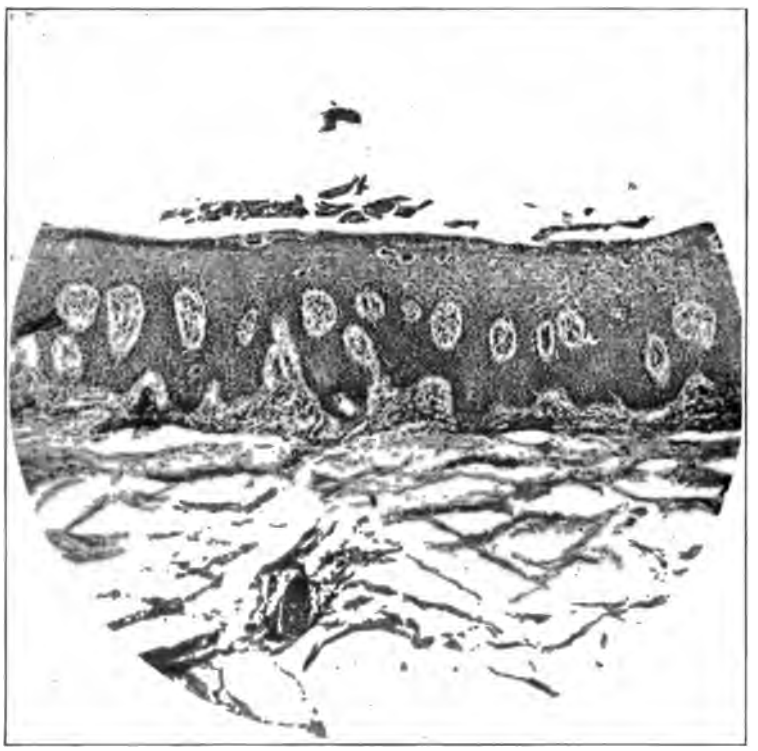

Fig 289.—Keratosis blenorrhagique. Moderate magnification. Showing acanthosis, papillary edema, epidermal abscesses, and dermal infiltration. (Courtesy of Dr. B. B. Beeson.)

Pathology.—The disease has been studied histologically by Chauffard, Fiessinger, Baermann, Herzog, and others. The papillae are swollen, and infiltrated with leucocytes, round cells and mast cells. The prickle layer is thickened, and the intracellular spaces contain many emigrated leucocytes. There is decided parakeratosis of the stratum corneum. So far as I know, Campbell is the only investigator who has found gonococci in the lesions.

Prognosis.—The lesions are usually resistant to treatment. In addition to the accompanying arthritis (which is present in about 90 per cent of the cases), the heart may become involved in the general disease, and gonorrheal ophthalmia also is a not infrequent complication.

Treatment.—Chauffard and Fiessinger recommend the use of soap and hot water as a macerating agent. Simpson found a resorcin and sulphur ointment beneficial. In the case treated by me, thorough scrubbing of the parts, followed by the application of an aqueous solution of argyrol (20 per cent), proved the most efficient. In any event, the lesions can seldom if ever be completely cleared up until the deeper foci are eradicated.

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KERATOSIS SEBORRHEICA.

Synonyms.—Keratosis senilis; Senile keratoma; Senile wart; Verruca plana seniorum; Seborrheic wart.

Definition.—A flat, rough, crusted or scaly keratotic lesion which occurs in elderly persons and in other individuals whose skins show more or less evidence of long-standing dry seborrhea.

Symptoms.—Seborrheic keratoses begin as small, round or oval, brownish macules. The sites of predilection are the face, scalp, trunk, particularly the interscapular and sternal regions, and the backs of the hands. When fully developed the growths are flat-topped, papular elevations, usually oval in outline, yellowish, grayish or brownish in color, sharply circumscribed, and covered with a firmly adherent scale which is usually greasy and velvety if the lesions are situated on the trunk or scalp, and harsh, rough and dry

if they are located on the face or hands. When the crust is carefully removed its under surface often presents numerous tiny projections which formerly extended into the mouths of the follicles. Not infrequently the location of an involved area is apparently dependent on some preceding slight injury of the skin, such as a nick from a razor while shaving. The tumors never disappear spontaneously, and may persist indefinitely without change, but generally, and especially in those instances in which the growths are exposed to constant or repeated irritation of any sort, the bases of some of them undergo further pathologic change and ultimately become malignant, the resulting carcinomas generally being of the prickle-cell type.

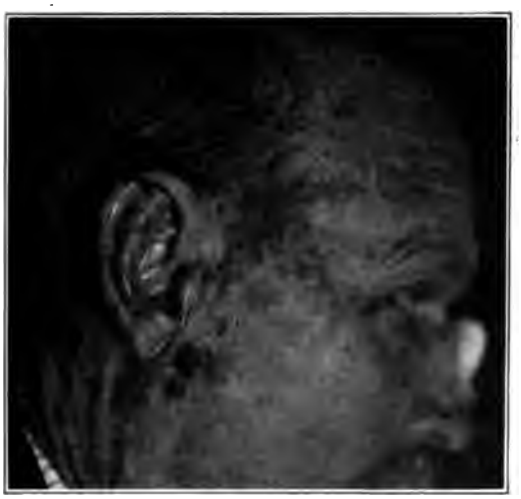

Fig. 290.—Seborrheic keratoses of face. Many of the lesions exhibit malignant tendencies.

Fig. 291.—Seborrheic keratosis of the keratoid type on margin of ear.

Etiology.—In the production of these cutaneous changes, age is an important, but not indispensable, factor. As Pusey has stated, the most important element in the production of seborrheic (or senile) keratoses is a peculiar quality of the skin, a quality which is usually inherited or congenital, but may be acquired, and which is characterized by harshness and dryness, with more or less evidence of long standing, dry seborrhea. Long continued exposure to strong sunlight and to sudden atmospheric changes aids in the preparatory process. The custom of applying a long descriptive term to a skin of this kind is unfortunate, for it tends only to confuse the unsophisticated. The condition, which is sometimes referred to as

"sailor's skin," is by no means confined to those who follow the sea, and typical examples of it are probably far more frequent on the plains of Kansas than on the Newfoundland banks.

Pathology.—The histopathology of seborrheic keratoses has long been a matter of controversy. Neumann found thinning and pigmentation of the prickle layer, atrophy of the derma, and hypertrophy of the sebaceous elements, with cystic changes in the hair

Fig. 292.—Seborrheic keratoses of the verrucose type. (Courtesy of Dr. A. J. Markley.)

follicles and their appended glands. Balzer reported the granular layer and stratum lucidum unaffected, the presence of a decided acanthosis, hypertrophy of the stratum corneum, and enlargement of the papillae, with some perivascular infiltration. Otherwise the cutis was normal. Hanford found acanthosis, with associated hypertrophy of the horny layer, and there were present throughout the epidermis numerous round and oval spaces, the walls of which were

Fig. 293.—Multiple squamous-celled carcinomata in a patien who had been troubled since his 15th year with seborrheic keratoses of the keratoid type on face and neck. (Courtesy of Dr. J. B. Shelmire.)

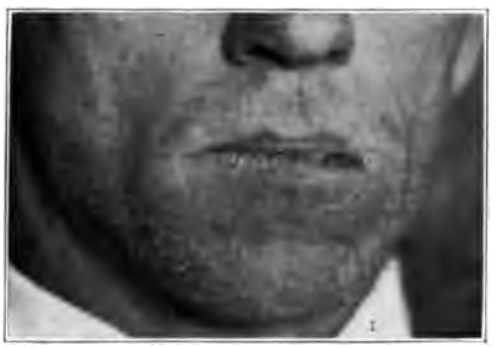

Fig. 294.—Seborrheic keratosis of lip.

lined with cubical epithelium. Pollitzer, who was first to investigate the condition thoroughly, studied sections from a considerable number of lesions some of which had been excised from a patient suffering with mycosis fungoides. He found the papillae enlarged and elon-

Fig. 295.—Early seborrheic keratoses.

Fig. 296.—Seborrheic keratoses of hand. The lesion near the base of the thumb has degenerated, and is exhibiting signs of malignancy.

gated, and containing many epithelioid cells, the majority of which were arranged alongside and parallel to the capillaries. The vessels themselves were unchanged, and the elastic fibers and sebaceous

glands also were normal. There was hypertrophy of the prickle layer, with parakeratosis. The follicular orifices were filled with horny substance. The coil gland ducts were dilated and cystic, many of the

Fig. 297.—Seborrheic keratosis which has degenerated, and become a prickle celled carcinoma.

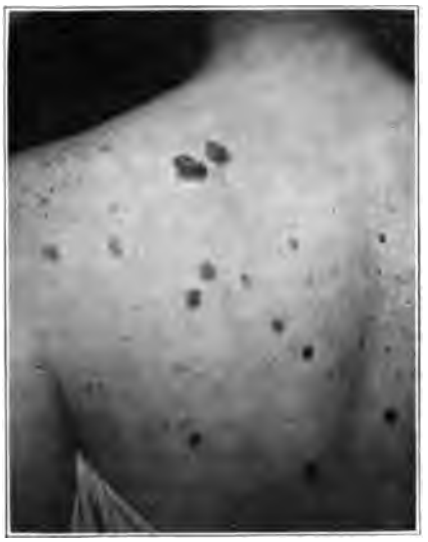

Fig. 298.—Seborrheic keratoses of the nævoid type.

cavities containing large numbers of leucocytes and degenerated epithelial cells. There was much free fat in the cutis and in the interspinal spaces of the prickle layer. Unna examined a series of the growths secured post-mortem from eight cases of the disease. The findings were very similar in

all, and he concluded that the lesions were true soft nævi which had undergone a peculiar form of fatty degeneration, and differed from ordinary nævi only in their containing more fat. Hartzell has recently gone thoroughly into the subject. He found in all of his specimens:

"A marked increase in the thickening of the corneous layer of the

Fig. 299.—Seborrheic keratoses on the dorsal surface of the hands.

Fig. 300.—Keratosis of the eye-ball. (Courtesy of Dr. T. S. Blakesley.)

epidermis, the nuclei of the cells being still present as fairly well-stained, slender spindles. The greatest increase in thickness was about the mouths of the hair follicles and the sweat ducts, the former being widely dilated and filled with horny plugs. The granular layer had in most places disappeared, but was still well preserved

about the hair follicles and sweat ducts. The rete mucosum presented considerable variation in the amount of alteration present. In the newer lesions there was but slight increase in the thickness of the rete up to actual invasion of the corium and beginning epithelioma. In a small lesion removed from one of the patients who also had multiple epithelioma there was a circumscribed downgrowth of the rete surrounded and penetrated by a cellular infiltrate composed of

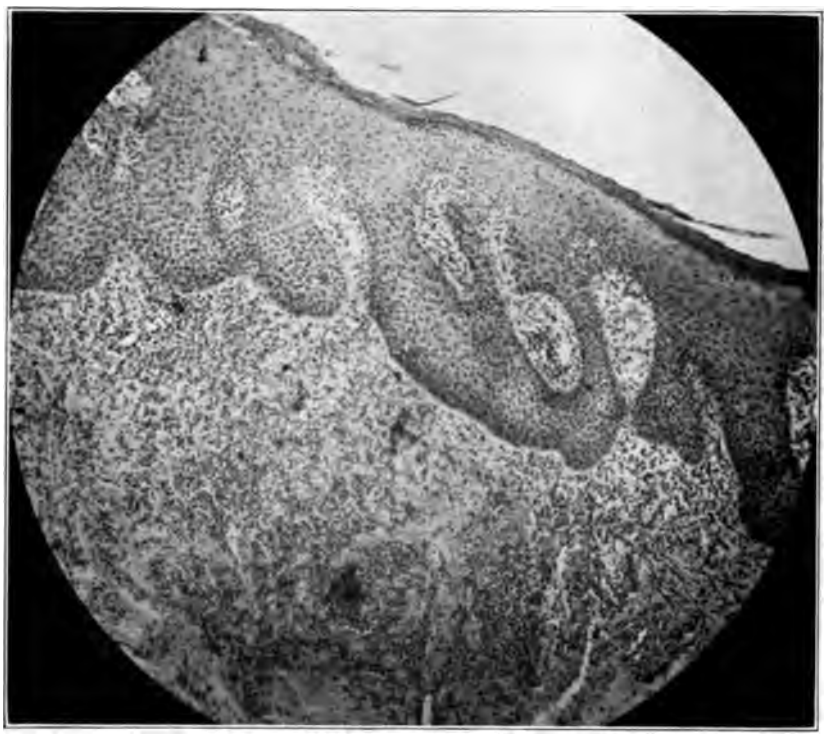

Fig. 301.—Very early stage of seborrheic keratosis of lip. The keratotic mass has been removed by means of an ointment, and the only signs of inflammation left are the acanthosis, papillary hypertrophy, and cellular infiltration in derma. Low magnification.

numerous mononuclear leucocytes, and in the corium, a moderate number of plasma and mast cells. With the exception of a decided flattening out, and in some cases the complete disappearance of the papillae, the corium presented but little alteration."

The disorder is an exceedingly common one in the Middle West, and in 1914 I had opportunity to study specimens obtained from thirty-one cases of the disease. After examining sections from a

dozen or more of the lesions, it was apparent that the growths could be roughly separated into three distinct groups: first, and most frequent, a keratoid variety, characterized by great corneous hypertrophy, with some parakeratosis, a moderate degree of acanthosis, slight proliferative changes in the germinal layer, and more or less flattening of the papillary bodies; second, a nævoid type, which was practically identical with Unna's "nævus seborrhœicus," and third an acanthoid or verrucose form, distinguished by consid-

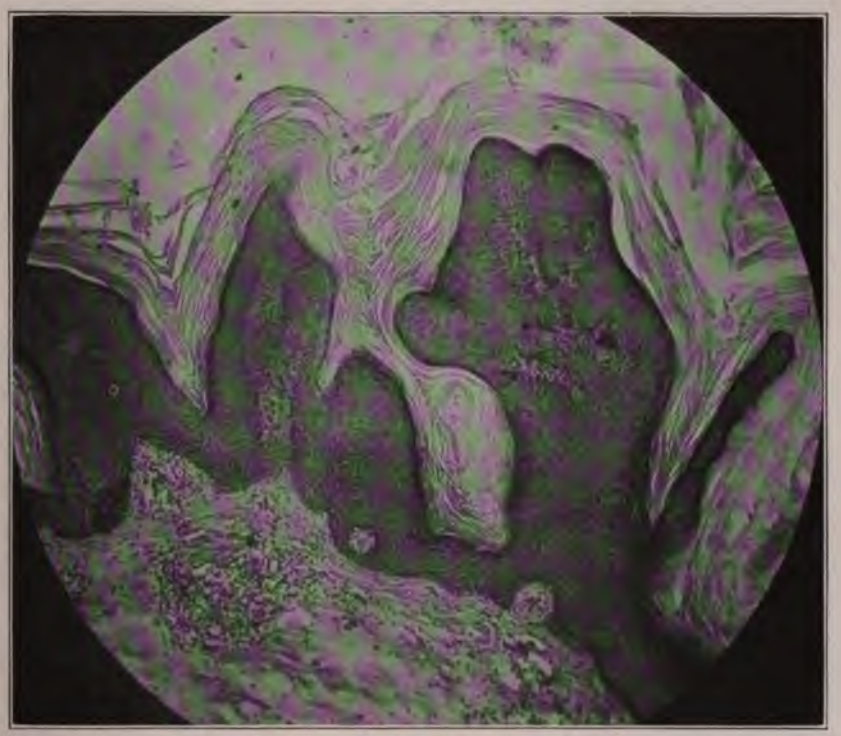

Fig. 302.—Seborrheic keratosis of the verrucose variety. Low magnification.

erable hyperkeratosis, very pronounced acanthosis, signs of exceedingly active proliferative changes in not only the stratum germinativum, but also at numerous other points in the rete, and enormous papillary hypertrophy. In these wart-like specimens the cutis shows inflammatory changes of a subacute nature, with capillary dilatation, extensive perivascular infiltration, and small collections of leucocytes and round and plasma cells scattered through the upper derma.

As the studies progressed, the group characteristics of the three types became more obvious, until toward the end, it was not a difficult matter to foretell accurately the histologic features of a majority of the growths even prior to excision.

Some of the more advanced keratoid tumors bore a distinct structural resemblance to early Röntgen-ray carcinomas (as represented by both comparative specimens and Wolbach's description), although the keratization of the epithelial processes extending downward into the derma was not so prominent a feature here as in tumors of the Röntgen irritation type. In the earlier keratoid lesions the most noticeable change in the cutis was the dilatation, with occasional development of cysts, in the sweat ducts. The sebaceous glands were practically normal in all three classes, despite the fact that all contained considerable quantities of free fat. The nævoid tumors were richest in this material, the acanthoid less so, and the keratoid least of all.

Fig. 303.—Early seborrheic keratosis of the verrucose type.

Of the thirty-four specimens excised, nineteen were of the keratoid variety, eleven of the nævoid, and four of the acanthoid. Need-

less to say, not all were typical examples, but the borderline cases were so infrequent that they could safely be disregarded.

From the point of view of prognosis, the keratoid lesions were by far the most dangerous. Nine of the patients who suffered from growths of this type presented also active manifestations of carcinomatosis. As Hazen and Ketron have shown, the ensuing cancers are usually of the basal-celled type.

Fig. 304.—Seborrheic keratosis of the keratoid type.

Treatment.—The earlier keratoid lesions are readily removed by frequent applications of a bland grease, such as rose water ointment. Afterward, the occasional employment of a lubricant of this kind will prevent a recurrence, provided care is taken to avoid the use of hard water and highly alkaline soaps. Men whose faces are affected should never shave with a dull razor, and, after shaving, no soap should be allowed to remain on the skin. The nævoid, verrucose and advanced keratoid types are more resistant to treatment, and a salve consisting of salicylic acid (1 part), sulphur (1 part), and petrolatum (30 parts), as recommended by D. W. Montgomery and by Stel-

wagon, is generally required to remove the outer layers. This ointment may be applied at night, the patch being covered with a bit of oiled silk, and the whole held in place by a cross of adhesive plaster. As soon as the corneous mass is softened, it may be gently removed with a bit of cotton moistened with benzine. Of all the caustics that have been recommended for use in this connection, none,

Fig. 305.—Advanced keratoid lesion which is beginning to show malignant changes. Thickening and condensation of corneous layer, follicular plugs, irregular acanthosis, inflammatory changes in papillae, and dilatation of sweat ducts.

in my opinion, equals Pusey's carbon dioxide snow. One thorough freezing, with moderate pressure, for a period of from thirty seconds to one minute, is usually all that is required. The lesion is then painted with tincture of iodine, and thymol iodide, or a similar anti-

septic, applied. If a bulky dressing is objectionable, a 5 per cent ammoniated mercurial ointment may be prescribed.

In growths that have already assumed a malignant character, the treatment is that of carcinoma of the skin. On the scalp, forehead, lips, trunk and limbs, radical excision is nearly always to be preferred. On the face, and particularly in the nasal and orbital regions, admirable results can often be obtained by the use of the x-rays or radium, as Burns and Blaisdell have demonstrated.

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KERATOSIS PILARIS.

Synonyms.—Keratosis suprafollicularis; Pityriasis pilaris.

Definition.—A chronic inflammatory disorder characterized by accumulations of horny material at the follicular orifices which give to the affected surfaces a peculiar, nutmeg-grater-like appearance.

Symptoms.—The condition is commonest in individuals whose skins are naturally rough and dry (xerodermatous), and the manifestations are more pronounced during the winter months. The individual lesions, which are pinpoint- to pinhead-size, whitish or grayish, acuminate papules, encircle the hair shafts at a point near the mouths of the follicles. They occur in variously sized patches, the sites of predilection being the lateral aspects of the thighs and the upper arms. Occasionally the disorder may involve the legs and extensor surface of the forearms, or even the scalp. In the latter instances, the pressure resulting from the outgrowth of the shafts is sufficiently great to tear loose the small, conical masses of epithelial cells and inspissated sebum from time to time, and the adherent material may bear a considerable resemblance to the ova of pediculi, or the nodular incrustations of piedra.

When one of the formations is forcibly removed, it leaves a small, temporary conical depression or pit which is gradually filled up by new corneous substance. Sometimes instead of piercing the papule,

the hair is coiled within the follicle, its normally free end resting against the corneous plug, or firmly clasped within it and showing externally only a dark dot. These cases, for which Unna has suggested the name of "*Keratosis suprafollicularis,*" are probably dependent upon two factors—retention, plus the action of a hypertrophic muscular apparatus. As Unna has said, the resistance which the hair experiences in its efforts to escape, and which causes a packing or tension on the under end of the follicle, evidently induces reflexly a permanent irritation of the arrector muscles, which are also stretched, since their lower end is inserted into the middle third of the follicle. This results in hypertrophy of the arrectores, and the resultant external and one-sided new force leads to certain of

Fig. 306.—Keratosis pilaris, in a man, age 25.

the follicles being sharply bent as well as twisted. In consequence, it is practically impossible for the imprisoned shaft to escape, and as it gradually increases in length it coils up with follicles until it is forcibly extracted, or until, as a result of irritation and consequent lowered resistance, infection with the ubiquitous staphylococcus occurs, and pustulation, with consequent sloughing, removes the offending obstruction and opens the pathway to the surface. There may be more or less associated pruritus, particularly during the cold months when the skin is dry and harsh from lack of lubrication.

Diagnosis.—The disorder is to be differentiated from cutis anserina, lichen spinulosus, lichen scrofulosus, and the miliary papular syphilide. In cutis anserina ("goose flesh") the lesions are not scaly, and are always evanescent. In lichen spinulosus the eruption

is usually more or less generalized, develops rapidly (sometimes overnight), and the lesions generally come out in crops. They are at first hyperemic, and are more closely aggregated than those of keratosis pilaris. The papules in lichen scrofulosus are seldom rough or keratotic, and occur in rounded or oval patches. They exhibit a predilection for the trunk and are often associated with lupus vulgaris and scrofuloderma. In the miliary papular syphilide the distribution is general, there is more or less lymphnode involvement, and the mucous membranes frequently are affected. In doubtful cases resort may be had to a serum test.

Treatment.—In anemic and debilitated individuals tonics, particularly cod-liver oil and iron are indicated. Locally the use of

Fig. 307.—Keratosis suprafollicularis. *H*, hair shaft; *M*, muscle; *K*, acute bend in follicle; *G*, coil gland. (Unna.)

alkaline baths, preceded by applications of green soap and followed by inunctions of rose water ointment, cocoa butter, or a lotion consisting of equal parts of glycerine, camphor water and rose water, will prove comforting. In persistent cases a small percentage of salicylic acid (5 per cent) and sulphur may be added to the ointment preparations. In keratosis pilaris involving the bearded region the skin should be kept soft and smooth by the use of a soothing cream, the beard should be well lathered before shaving, and a very keen razor, "once over," employed. When the "ingrowing hairs" develop they should be extracted as early as possible, and tincture of iodine applied.

Lichen Spinulosus (lichen pilaris seu spinulosus) is a disorder

which resembles keratosis pilaris in many respects. According to Crocker, who first described it, the affection is "an inflammatory disease of the hair follicles, in which a spiny epidermic peg occupies the center of the papule." The majority of the patients are children, and the lesions, which are pinhead-sized, conical, spinous papules, generally develop acutely or in crops, and may persist indefinitely. There is some hyperemia at first, but this gradually subsides, and the lesions become grayish or yellowish in color. Subjective symptoms are slight or altogether wanting. The sites of predilection are the back of the neck, the trochanteric region, the abdomen, the thighs, and the extensor surfaces of the arms. The cause of the disorder is not known. Histologically, Crocker found

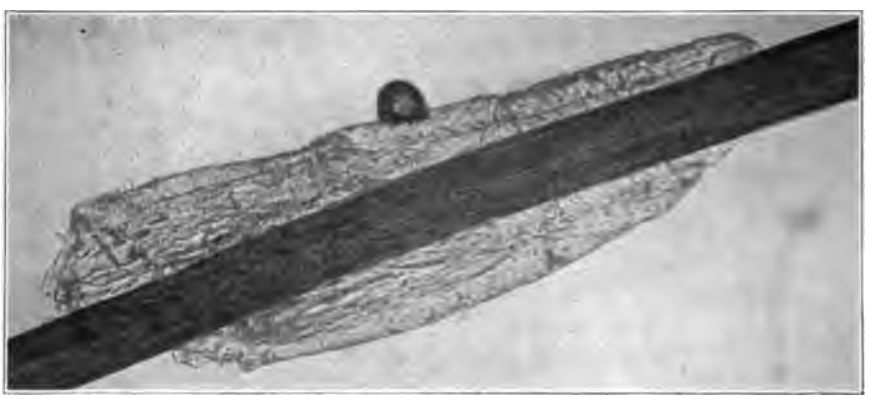

Fig. 308.—Keratosis pilaris of scalp, showing corneous mass encircling hair shaft. Low magnification.

"congestion of the vessels, followed by slight effusion around the follicle, and hypoplasia of the epidermic cells surrounding it." The treatment is similar to that recommended for keratosis pilaris.

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KERATOSIS FOLLICULARIS.

Synonyms.—White's disease; Darier's disease; Ichthyosis follicularis; Psorospermosis follicularis; Keratosis vegetans.

This rare disorder was first accurately described by J. C. White, in

1889. In the same year, Darier, working independently, also reported a case of the disease, together with an exhaustive study of the histopathology.

Symptoms.—The eruption, which develops slowly, is symmetrical, and as a rule more or less generalized. The scalp and face are usually affected first, but the lesions reach their highest stage of

Fig. 309.—Darier's disease. (Courtesy of Dr. J. B. Shelmire.)

development when located in the inguinal and anal regions. The primary lesions are usually firm, pinhead- to pea-sized, grayish or reddish papules, commonly seated at the pilosebaceous orifices, and are partially covered by firmly adherent brownish or blackish, greasy, horny crusts. When these crusts are removed, a minute, funnel-shaped depression is left in the top of the papule. As the papules grow older they increase in size, and become darker in color, until

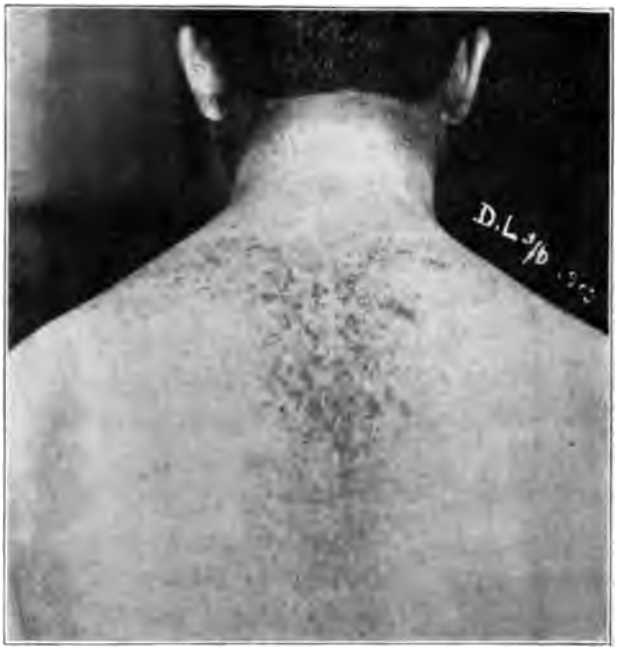

Fig. 310.—Keratosis follicularis. (Courtesy of Dr. David Lieberthal.)

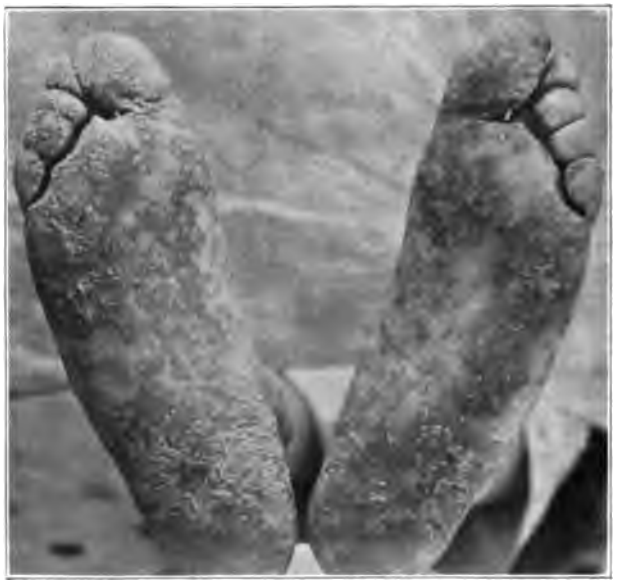

Fig. 311. Keratosis follicularis of soles. (Courtesy of Dr. John W. Perkins.)

they may assume a dark brownish, or even purplish hue. Some of the corneous plugs project only slightly, if at all, above the general surface of the skin. The lesions are at first discrete, but later tend to become confluent, and on the scalp the resulting masses of oily crusts are not unlike those occurring in some forms of seborrheic dermatitis. In the course of time the papules tend to become larger, and form reddish elevations and papillomatous growths which sometimes coalesce. As a result of pyogenic involvement, the resultant tumors may suppurate, or their surfaces may be the seat of more or

Fig. 312.—Keratosis follicularis of palm. The large lesion on thenar eminence is a biopsy wound.

less superficial ulceration. There is frequently associated hyperidrosis and seborrhea, and this combination, with resulting decomposition, may give rise to a highly offensive odor in the papillomatous areas. In the genital and anal regions the lesions may exhibit vegetative tendencies (a condition to which Darier refers as the second period of the disease), and involve the interfollicular as well as the follicular tissues. The mucous surfaces are occasionally attacked. The general health is seldom seriously involved.

Etiology.—The cause of keratosis follicularis is not known. The majority of the reported cases have been in males, and the malady

generally begins early in life. Two or more cases occurring in the same family are not unusual.

Pathology.—The histology of the lesions has been investigated by Darier, Bowen, Unna, Boeck and others. The disease process is primarily a hyperkeratosis of the pilosebaceous and sweat duct orifices. Originally Darier described the occurrence near the base of the plugs of numerous, small, round, granular masses, enclosed in a double contoured, thick membrane. He at first believed the bodies were psorosperms, but it has since been proved that they are hyaline degenerated epithelial cells. While of no etiologic significance, at times their presence is of considerable diagnostic value. There is more or less acanthosis, and many of the prickle cells contain mitoses.

Fig. 313.—Darier's disease, showing involvement of nails. (Dr. J. B. Shelmire's case.)

The adjacent papillae are hypertrophied, and the seats of diffuse cellular infiltration. Both corium and rete contain considerable amounts of pigment, particularly in the older lesions. The skin glands are not affected.

Diagnosis.—The malady is to be differentiated from acanthosis nigricans, molluscum contagiosum, and ichthyosis. Acanthosis nigricans commonly attacks adults, and the mucous membranes are generally involved early, pigmentation is a marked and characteristic feature, cancerous involvement of some internal organ is almost the rule, and Darier's psorosperm-like bodies are absent. In molluscum contagiosum the eruption is never generalized, and the lesions are shiny and pearl-like, never greasy and crusted. The history, the

Fig. 314.—Keratosis follicularis, showing cross-section of an individual lesion. (Courtesy of Dr. David Lieberthal.)

Fig. 315.—Keratosis follicularis, moderate magnification. (Courtesy of Dr. David Lieberthal.)

character and distribution of the lesions, and the absence of follicular involvement will serve to identify ichthyosis.

Prognosis.—The malady is a chronic and progressive one. The

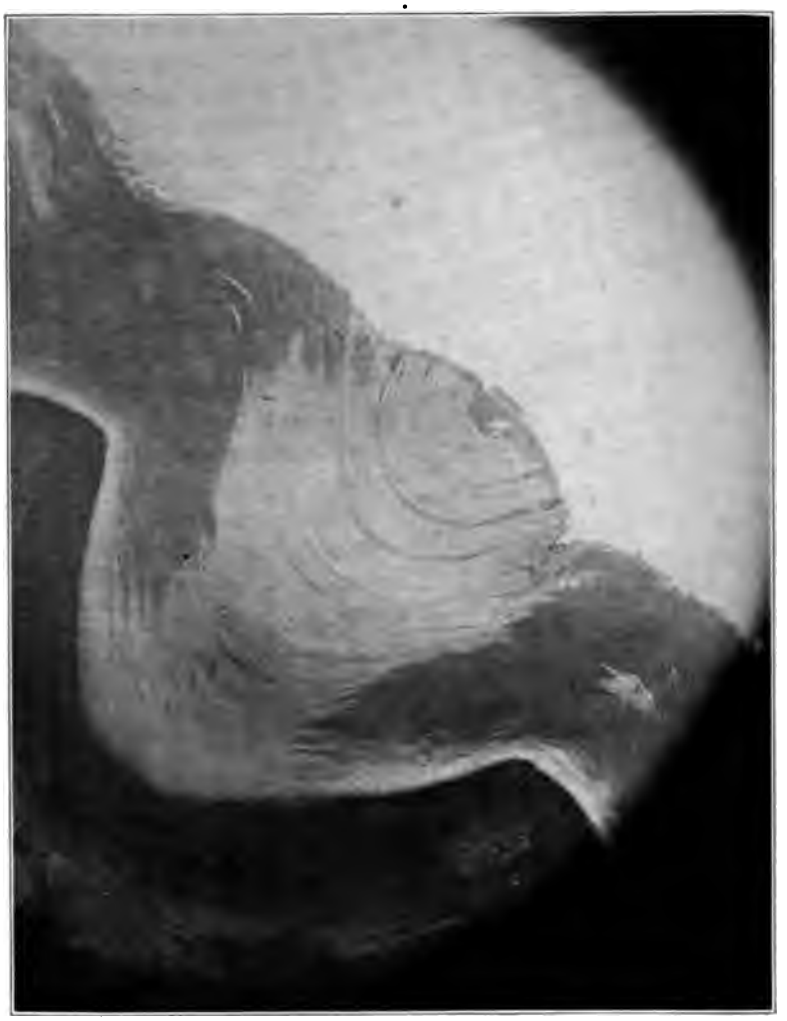

Fig. 316.—Mouth of an affected coil gland duct in a case of keratosis follicularis of the palm. Low magnification.

symptoms can be ameliorated by treatment, but a permanent cure cannot be safely promised.

Treatment.—Ointments containing salicylic acid, sulphur, resorcin, and similar agents may sometimes be prescribed with resulting bene-

fit. The vegetative lesions are to be kept clean, and covered with antiseptic dusting powder (thymol iodide, europhen, boric acid, etc.). In recent years a number of observers have reported favorable results following the use of the x-rays, and this agent should at least be given a trial in every instance. Schalek reports great improvement in a severe case following Röntgen therapy. He used a Coolidge tube and rayed deeply. Relief from itching was immediate, and the skin

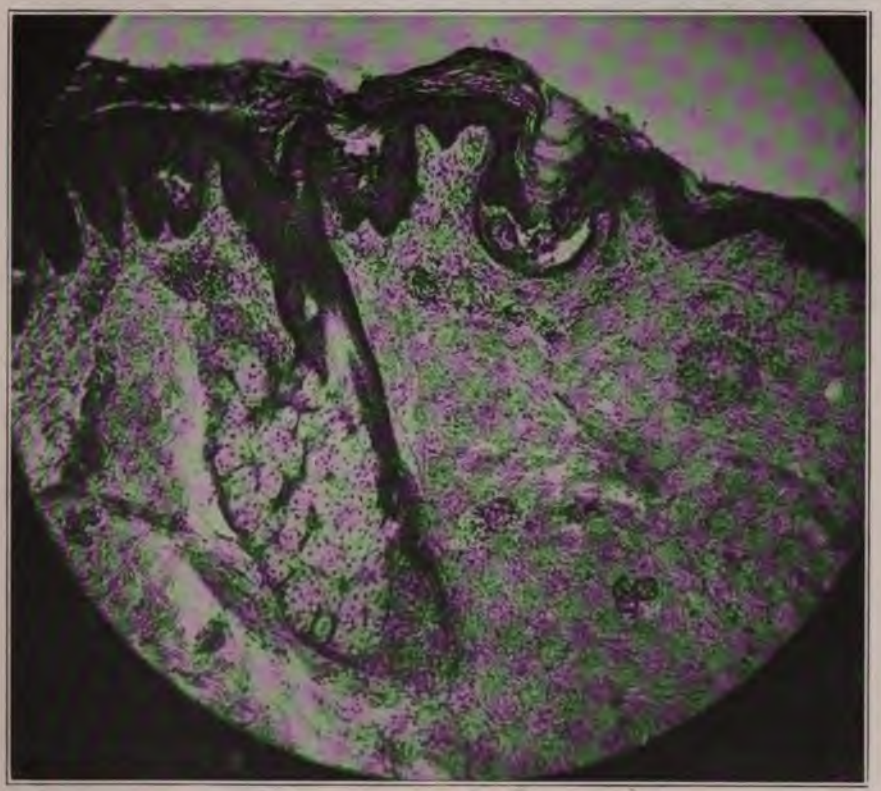

Fig. 317.—Darier's disease.

gradually became much softer and smoother. Fulguration, or cauterization, at times proves helpful.

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KERATOSIS FOLLICULARIS CONTAGIOSA.

Synonym.—Brooke's disease.

Brooke, of Manchester, has described an affection which closely resembles keratosis follicularis in some respects, but is apparently contagious. The majority of the reported instances have occurred in children. The eruption is symmetrical, and more or less generalized. The sites of predilection are the nape of the neck, the shoulders, and the extensor aspects of the limbs. The primary manifestations are those of a general corneous thickening, with consequent deepening of the natural furrows of the skin. In these polygonal areas small, black, comedo-like points appear, and later develop into small spikes which project outward for a considerable distance. Later the horny plugs develop into large, brownish papules, the tips of which are still crowned with the straight or curved horny spicules. The papules sometimes coalesce, forming rough, yellowish-brown plaques. The skin is dry and harsh, never greasy and scaly as in keratosis follicularis. Darier's bodies are not present.

Brooke would place in this group Morrow's case of keratosis follicularis, some of Hardy's cases of acné sebacée corné, and Wilson's acne sebacea cornea.

Histologically, keratosis follicularis contagiosa is characterized by a hyperkeratosis which affects not only the sebaceous and sweat orifices but also the intervening integument. According to Unna, the closure of the mouth of the follicle results in the formation of comedo-like cysts, or in deformities of the hair and of the whole follicle. The hyperkeratosis may be limited to the mouth of the follicle (giving rise to lesions resembling those of keratosis pilaris), or it may involve the entire appendage, with the resulting formation of large, horny pearls which contain not only the remains of the hair follicle, but also the contiguous sebaceous glands. The horny spines result from early hyperkeratosis of the follicular epithelium, a process which proceeds so rapidly that it forces the newly formed horny mass above the level of the skin, and the projecting spine really consists of a series of inverted cup-like, corneous masses.

Prognosis and Treatment.—The disorder responds readily to treatment. Inunctions of an ointment containing iodide of mercury proved curative in Brooke's[1] cases.

[1] *Brooke*, Internat. Atlas, 1892, vii, plate xxii.

KERATOSIS PALMARIS ET PLANTARIS.

Synonyms.—Ichthyosis palmaris et plantaris; Keratoma palmare et plantare hereditarium; Tylosis palmæ et plantæ; Symmetric Keratodermia.

Fig. 318.—Keratosis palmaris et plantaris in an infant.

Fig. 319.—Keratosis palmaris et plantaris.

Fig. 320.—Keratosis plantaris in a case of keratosis palmaris et plantaris. (Courtesy of Dr. H. C. Baum.)

Definition.—A thickening of the horny layer of the palms and soles, sometimes congenital, but usually hereditary, and occurring in several generations.

Fig. 321.—Keratosis palmaris et plantaris.

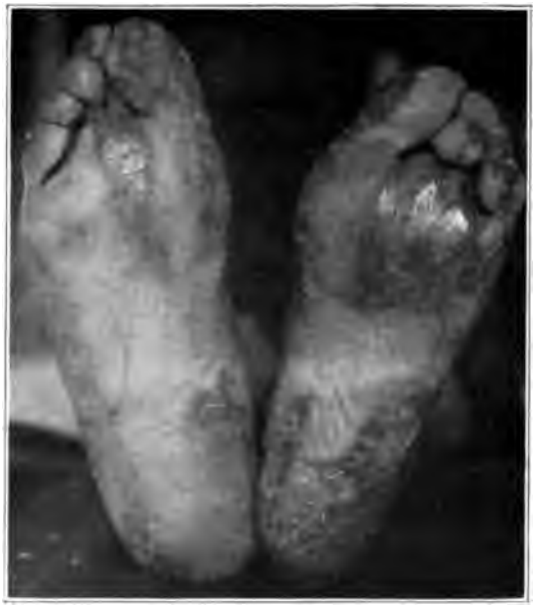

Fig. 322.—Keratosis plantaris in a case of keratosis palmaris et plantaris.

Symptoms.—The disorder sometimes affects only the palms, but as a rule the soles with the exception of the inner border of the arch also are involved. Occasionally the integument covering the knuckles

and the sides of the interphalangeal joints is calloused and roughened. The distribution is symmetrical. The horny layer of the skin in the affected region is yellowish or brownish in color and greatly thickened, with exaggeration of the natural surface lines. There are no accompanying signs of inflammation, and at the palmar and plantar margins the affected skin merges abruptly into the healthy tissue. As Unna has stated, the disorder develops most frequently in individuals

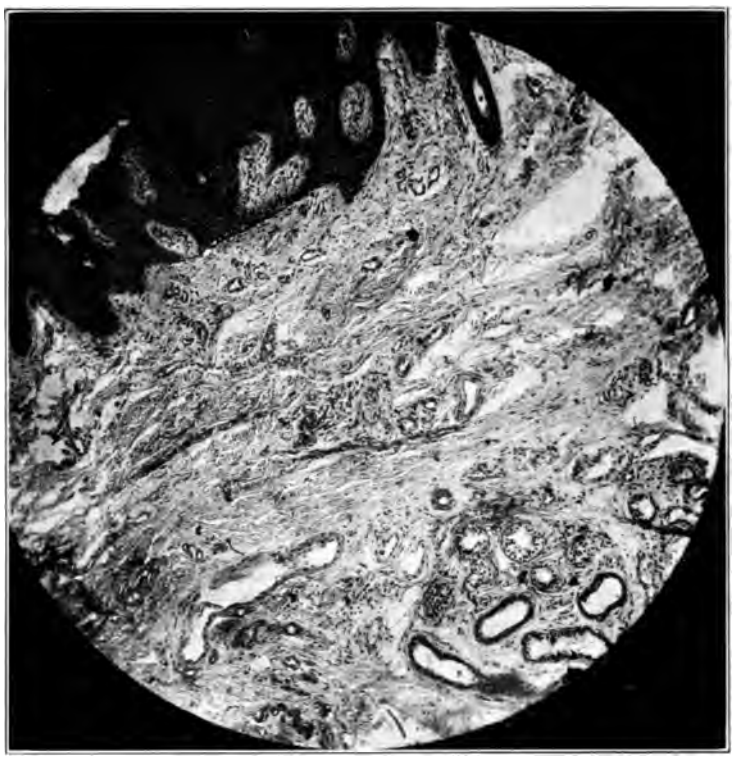

Fig. 323.—Keratosis palmaris, showing dermal changes. Moderate magnification.

who suffer from hyperidrosis of the hands and feet, but in well developed cases the affected areas are usually dry and translucent. Aside from the pain which may result from the occasional development of deep fissures, there are no subjective symptoms. Aberrant types of the disease in which erythema, vesiculation, and other signs of inflammation were present, have been reported by Brooke, Crocker and others.

Etiology and Pathology.—The cause of the disease is not known.

Usually it is inherited, occasionally it is congenital, and exceptionally it is acquired. Hyperidrosis may play some part in the etiology of the acquired cases. The hereditary type may be confined to one sex, and oftentimes its occurrence may be traced through several generations. Thus, in the examples recorded by Crocker and by Dale, five generations had been affected, in Unna's and in Stelwagon's cases

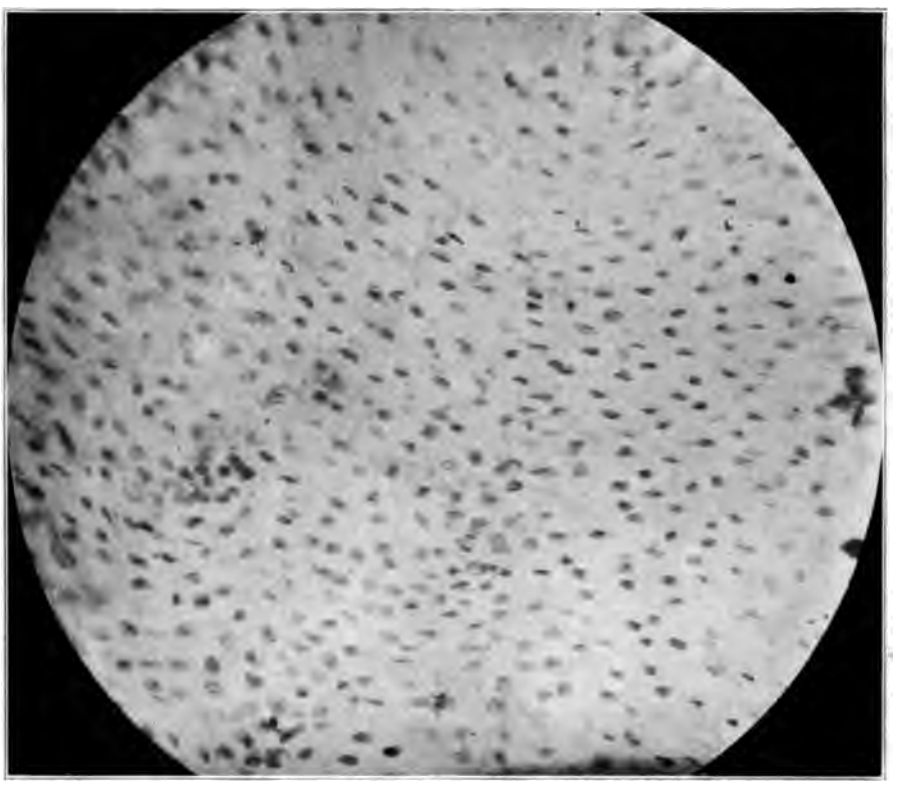

Fig. 324.—Keratosis palmaris, showing parakeratosis. High magnification.

three generations, and in one of my own patients both the mother and the maternal grandmother had been victims of the disorder.

Histologically, the lesions closely resemble those of callositas.

The exact nature of the "Mal de Meleda," a disorder which occurs in Meleda, and which somewhat resembles keratosis palmaris et plantaris, is as yet unsettled.

Diagnosis.—The history, the symmetrical distribution of the lesions, and the absence of inflammatory manifestations are sufficient

for recognition. Callositas, ichthyosis, arsenical keratosis, and eczema must be excluded.

Prognosis.—The condition can be alleviated, but permanent betterment or cure can seldom if ever be obtained.

Treatment.—Sodium arseniate, and sodium cacodylate by injection, and ichthyol internally, have been recommended, but the main dependence is to be placed on local applications. Of the various keratolytics, salicylic acid, alone or combined with green soap, is probably the most valuable. Hyde, Ormsby, and others have reported encouraging results following the use of the x-rays, and I have found this agent a helpful and valuable one. It should be employed with caution, as a severe reaction in these regions is accompanied by intense pain, but in experienced hands the benefit derived far outweighs the slight danger involved.

VERRUCA.

Synonym.—Wart.

Definition.—A small, circumscribed, autoinoculable, epidermal and papillary growth of variable size, shape and consistency.

Several clinical forms are recognized, although all possess the same essential histological characteristics.

Verruca Vulgaris.—This is the type commonly seen on the hands and fingers. The lesions are single or multiple, pinhead- to pea-sized, rounded, oval or irregularly-shaped, papilliform excrescences. In color they are grayish, yellowish, or brownish. They give rise to no subjective symptoms. The lesions are usually discrete, but neighboring verrucae may coalesce, forming small rugose plaques. Although the dorsal surfaces of the fingers, hands and wrists are the sites of predilection, no region is exempt. As Crocker has stated, the little growths sometimes develop in great numbers about the buttocks and thighs as a symptomatic condition in acanthosis nigricans.

The disorder gives rise to lesions of a peculiar aspect, when it involves the palms and soles *(verruca palmaris; verruca plantaris; papilloma of the sole)*. This condition was first and accurately described by Dubreuilh in 1895, and is a comparatively common one, particularly in college athletes and others who are in the habit of wearing thin-soled shoes for outdoor walking. I have met with several instances of the disorder on the finger tips of seamstresses. Superficially, the lesions, which are most frequently located over the second metatarso-phalangeal joint or on the heel, resemble small, oval cal-

losities. They are very sensitive to pressure, manipulation often giving rise to a prickling sensation, like that caused by a thorn in the foot. When the overlying epidermal "lid" is removed, by means of a sharp knife, or the application of a keratolytic, a peculiar, well-like cavity, partially filled with moist, tough, tow-colored corneous material, is exposed. When the surface mass is scraped away the tender bleeding tips of the hypertrophied papillae become apparent.

The so-called *verrucae planae* are of two types. *Verrucae planae seniorum,* or *Verrucae seborrheica,* occurring in adults, and *Verrucae planae juveniles,* affecting children. The former are described under keratosis seborrhœica. Juvenile warts are small, square or polygonal,

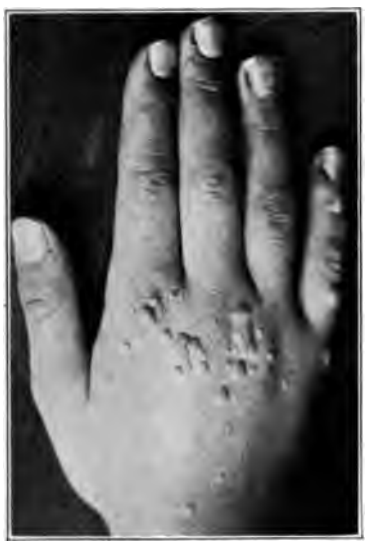

Fig. 325.—Verrucae vulgares.

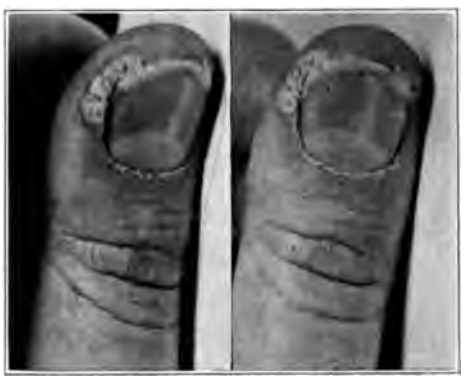

Fig. 326.—Periungual verrucae. (Courtesy of Dr. H. C. Baum.)

yellowish or brownish, pinhead- to pea-sized, flat or dome-topped growths which develop on the face, forehead, and dorsal surfaces of the hands. They may be discrete, but as a rule exhibit a tendency to grouping, and may even coalesce. They are sometimes found associated with lesions of the common type in the same individual. They give rise to no subjective symptoms, but are often quite resistant to treatment.

Verruca Digitata.—This variety, which occurs most frequently on the face and scalp, is characterized by the presence of several or more filiform projections, with horny caps, closely grouped on a com-

paratively narrow base which, in turn, may be separated from the surface of the skin by a slightly constricted neck. This variety is probably identical with the verrucose, or acanthoid, type of seborrheic keratosis (q.v.), and may in some instances serve as a starting point for the development of cutaneous horns.

Verruca Filiformis.—This is a small, slender, flexible, thread-like growth, covered with smooth and apparently normal epidermis. The sites of predilection are the neck and the eyelids. The lesions are usually single, but may be multiple, and discrete or grouped. Kaposi believed them to be minute fibromata (Hyde).

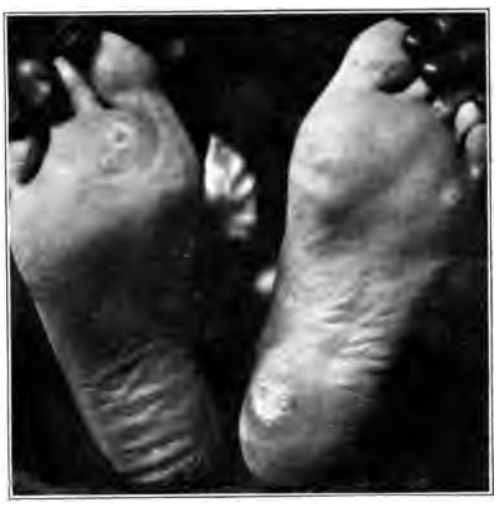

Fig. 327.—Verrucae plantares. The covering has been removed from the lesion on the left heel.

Verruca Acuminata.—This variety, which is also known by the names of *condyloma acuminatum* and *venereal wart,* develops near the mucocutaneous junctures and in other moist localities. Heidingsfeld has demonstrated that it may occur on the tongue, and at other points in the buccal cavity, and has suggested for the lingual lesions the designation of "*condyloma acuminatum linguae.*" The formations consist of closely aggregated collections of pointed, tufted, or pedunculated, pinkish or purplish projections of varying length and consistence. If situated on free surfaces they are dry and comparatively odorless, but in certain moist localities (as the vulvar margin, and beneath the foreskin) they become covered with pus, macerated epithelium and decomposed secretions, and may give rise to a high-

ly offensive odor. In these localities, as a result of irritation, friction, heat, moisture, and an excellent blood supply, they usually grow luxuriantly, and by peripheral extension involve areas of considerable extent. They develop quite rapidly as a rule, are autoinoculable, and seldom tend to disappear spontaneously.

Etiology.—Warts are commonest between the first and second decades of life. Their essential cause is not known, although Kühnemann has described a bacillus which some authorities believe to be etiologic. Jadassohn and others have successfully performed inoculation experiments, and it is exceedingly probable that at least two

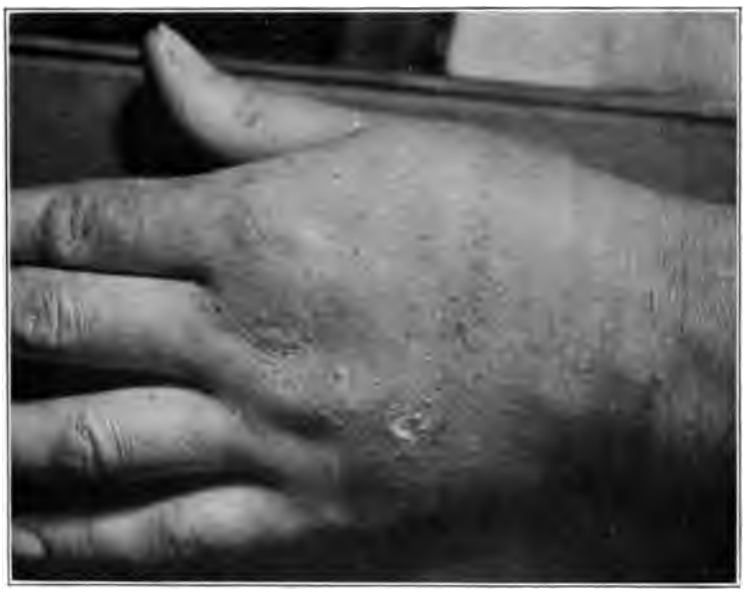

Fig. 328.—Verrucae planus juveniles.

of the commoner types (verruca vulgaris and verruca plana juvenilis) are autoinoculable, and, under favorable circumstances, are capable of reproducing themselves when planted on susceptible soil. The presence of an area of lowered resistance, such as might result from a bruise or similar injury, is a strong predisposing factor, particularly in plantar and palmar verrucae.

Pathology.—According to Unna, there are three distinct stages in every individual wart, that of commencement, that of acme, and that of regression. The first stage is characterized by a localized acanthosis, with associated hyperkeratosis. As a result of these

changes the underlying papillae are depressed and the papillary body as a whole is passively stretched and flattened. The few, invariably vascular, papillae which resist the epithelial growth are thinned and elongated. Both the granular and horny layers are thickened. When the lesions have reached a diameter of two millimeters or more, newly formed epidermal ridges and projections commence growing into the cutis, which now shows a reaction in the form of dilatation of the papillary vessels, with ensuing slight, superficial hyperemia. The cutis apparently opposes considerable resistance to the penetration of the epithelial ridges, and the latter are never broad, but pointed and bent toward the center of the growth. In consequence, the lesions are

Fig. 329.—Filiform verrucae of tongue. (Courtesy of Dr. John W. Perkins.)

never deeply seated, and can be readily removed with a sharp spoon. The new growth of the epithelium is soon arrested, and there remains simply a small dimpled depression of the cutis, from the center of which arises a common papillary trunk which expands above, and is lost in the long, thin papillae. The prickle cells at the outer margin are small and closely packed, and contain numerous mitoses. They retain their size until the surface is almost reached. Above the papillae the number of layers and the size of the keratohyaline granules diminish, but even the tips of the papillae are generally covered with one or more layers of finely granular cells. In the interpapillary depressions many of the cells have lost their nuclei, but those covering the sides and apices of the papillae all are nucleated. In the stage of

regression the new formation of prickle cells is arrested, and mitoses are no longer to be found in this layer. The process of cornification continues, and the upper and older part of the growth becomes fissured and broken, and exhibits the typical rugose appearance of verrucose growths. The histology of the juvenile wart has been carefully studied by Darier, Lupis, Thin, C. J. White, and others, and in some respects coincides with that of verruca vulgaris. The marked hyper-

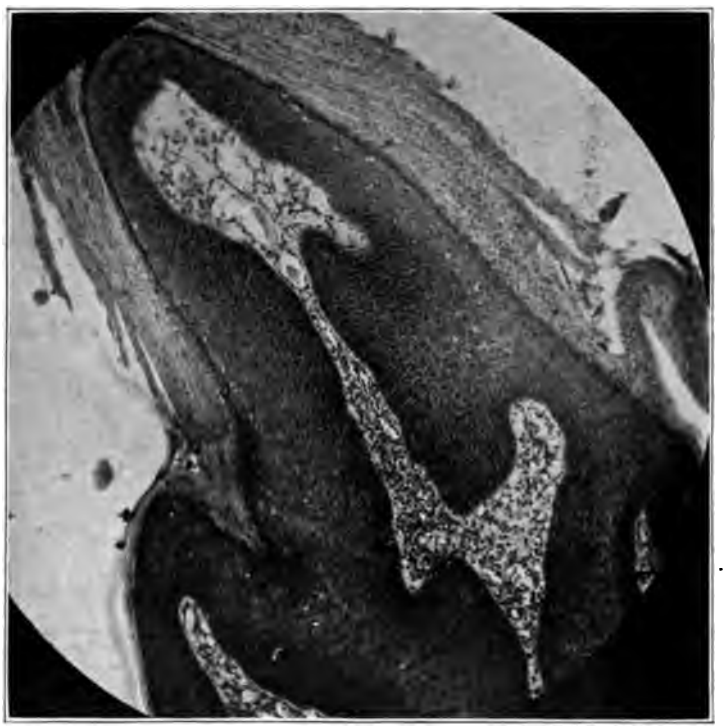

Fig. 330.—Tip of ordinary wart, showing papillary elongation, acanthosis, and hyperkeratosis. Moderate magnification.

keratosis is absent, however, and there is no in-turning of the epithelial ridges. The structure of the plantar warts has been investigated by Dubreuilh, Bowen, and myself. According to Bowen, there are no important changes in the cutis. There is a considerable degree of intrapapillary cellular infiltration. Toward the center of the lesion the papillae are flattened, but at the margins these structures are materially lengthened. Serial sections through an entire lesion show at the periphery the general characteristics of verruca vulgaris; pronounced acanthosis, papillary en-

largement, and down growth of the interpapillary plugs, together with pronounced hyperkeratosis. The stratum granulosum is much thickened. Near the center of the lesion many small groups of rete cells have become swollen and vacuolated, and often there is an accompanying tendency to the precocious development of keratohyaline, which often is heaped up at the periphery of the cells around the central cavity. These cells retain their nuclei, which, as a rule, are very much swollen. The vacuolation becomes more marked as the

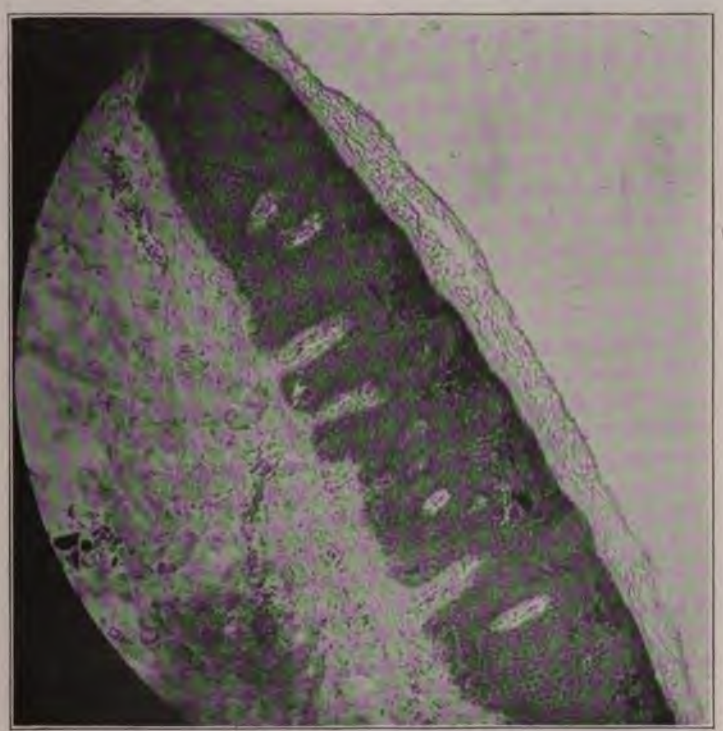

Fig. 331.—Verruca plana juvenilis. Low magnification.

center of the tumor is reached. The central mass of the growth consists of heaped up masses of imperfectly keratinized horny material, resting on a base of reticulated rete. The nuclei of many of the vacuolated cells in the lower regions of some of the lesions contain minute, round or crescentic, highly refractile bodies which resemble protozoa, but which probably represent some form of nuclear degeneration or alteration.

In the *acuminate verrucae* the lesions have a large connective tis-

sue core, and a very rich blood supply. In addition, they are distinguished from common warts by "a thin horny covering and the absence of hyperkeratosis, the remarkable size of the prickle cells and the interspinal spaces, the numerous and ever-present mitoses, even in the upper prickle layers, the complicated furrowing of the surface, the constant active dilatation of the vessels, which later gives rise to

Fig. 332.—Verruca plantaris, showing epithelial columns, with degenerated cellular changes and "ballooning." Protozoa-like bodies at *A* and *B*. Moderate magnification.

a chronic inflammation, with cell formation, leucocytic emigration, and abundant serofibrinous exudation, and, finally, the persistent papillary furrowing by the grouping epithelium" (Unna).

Diagnosis.—Ordinary warts are so familiar and of such common occurrence that the diagnosis is generally made by the patient himself. The plantar type of lesions may be confused with corns or callosities, but the true nature of the verrucose growth can readily be

exposed by shaving off the superficial corneous layers. Juvenile warts may resemble lichen planus lesions, or even small nævi. Their color, distribution (usually on the face and forehead), and the absence of subjective symptoms distinguish them from the former, while their history, number and consistence should prevent confusion with the latter. Acuminate warts are to be differentiated from the syphilitic condylomata. The lesions of xanthoma (xanthoma multiplex and xanthoma diabeticorum) and of angiokeratoma may bear some resemblance to verrucae, and their clinical characteristics should always be borne in mind when apparently unusual types of the commoner disease are encountered.

Prognosis.—Warts are essentially benign in character, and in children and in young adults seldom if ever give rise to serious symptoms. In elderly persons, however, and particularly in individuals whose skins are the seat of long standing dry seborrhea, the lesions may ultimately assume a malignant character, particularly if they are injured or otherwise irritated.

Treatment.—Of the various internal remedies suggested none are particularly reliable or efficient. Magnesium sulphate, as originally recommended by Colrat, of Lyons, is probably the most popular. Its exact mode of action is not known. Arsenic probably stands second on the list, and dilute nitromuriatic acid, third. Of the various local methods, I have found the sharp spoon best. The lesions are first anesthetized by means of novorennin, injected with a fine, sharp needle, and then scraped out. The base is then touched with tincture of iodine. If somewhat elevated, the little excrescences may be clipped off with sharp, curved scissors, and iodine applied. Other serviceable measures are the negative galvanic current, cauterization with zinc chloride, formalin, trichloracetic acid, liquor potassæ, acid nitrate of mercury, or similar caustics, and freezing with carbon dioxide snow. Daily applications of salicylic acid (20 per cent in collodion, or a saturated alcoholic solution) sometimes bring about a cure, but the method is a slow and tedious one. Vleminckx's solution also acts well at times. I have found fulguration, as originally recommended by Bulkley, a safe, rapid, cleanly and efficient procedure in many instances. If the lesions are numerous nothing gives better results than the x-rays. The remedy was first suggested to me by Pusey, and I have found it an exceedingly valuable one in this condition. Heavy exposures are not required, and the results are excellent.

Plantar and *palmar warts* are much more resistant to treatment than the ordinary surface growths. If several or more in number,

dependence is to be placed mainly on the x-rays or on radium. The latter agent applied for a period of one hour daily, on eight successive days, was followed by a complete cure in a recent case. No screen was employed. Excision of the lesions is generally followed by a recurrence. Consequently, if operative procedures are to be resorted to, they should consist only of the removal of the epidermal "lid," followed by thorough cauterization of the underlying growth. Of the various caustics, carbon dioxide snow is one of the most dependable, although chrysarobin, salicylic acid, caustic potash, and acid nitrate of mercury all have their advocates. *Acuminate verrucae* of the dry variety may be snipped off with scissors, and their bases touched with nitric acid. In attacking lesions of the moist variety, cleanliness is the first essential, and this measure, when combined with liberal applications of an astringent, mildly antiseptic dusting powder is generally all that is required to bring about a cure. Of the various powders that have been suggested, thymol iodide is one of the best, although powdered alum, calomel, or boric acid (the later alone or mixed with salicylic acid—5 per cent) sometimes acts admirably. In some instances, lotions are preferable to powders, and recourse may be had to an aqueous solution of aluminum acetate (5 per cent), or alcoholic solution of tannin (20 per cent), or a mixture of equal parts of alcohol and water with salicylic acid (5 per cent) added.

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SYNOVIAL LESIONS OF THE SKIN.

Hyde and, more recently, Lingenfelter, and Ormsby have called attention to certain vesicle-like lesions of the skin which occasionally develop in the vicinity of joints, particularly on the dorsal aspect of the interphalangeal, metacarpophalangeal, and metatarsophalangeal articulations. The lesions are smooth or wart-like, cystic tumors and are always located over the site of bursae. The surface may be smooth and shiny, but occasionally it is rough and verrucose. When the lesion is

punctured, a yellowish or brownish, syrupy fluid exudes. As soon as the wound closes, the cyst refills. Pain may result from overdistention.

Treatment.—The lesions may be carefully dissected out, but removal must be complete or recurrence takes place. Hyde and Ormsby successfully employed the x-rays in several instances, and in the case reported by Lingenfelter this agent exerted a curative effect. I have employed

Fig. 333.—Synovial lesion of the skin.

Fig. 334.—Synovial lesion of skin. A not unusual location.

radium (40 mgm. hours, unscreened) with satisfactory results in one case. Electrolysis also may be tried.

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POROKERATOSIS.

Synonyms.—Keratodermia eccentrica; Hyperkeratosis eccentrica; Hyperkeratosis figurata centrifuga atrophica.

Definition.—A chronic inflammatory affection of the sweat ducts and sebaceous orifices which is sometimes hereditary and is characterized clinically by the occurrence of slightly elevated, warty lesions which gradually enlarge peripherally and give rise to variously sized and shaped atrophic patches having elevated seam-like borders.

Symptoms.—The disorder was described simultaneously by Mibelli and Respighi in 1893. In view of the marked hyperkeratosis at the

sweat duct openings Mibelli suggested the name of "porokeratosis" for the disease, a title which has met with general acceptance and approval. The sites of predilection are the dorsal and palmar surfaces of the hands and fingers, the face and scalp, and the sides and nape of the neck. The disease generally begins as a small, slightly elevated, wart-like papule, which slowly enlarges peripherally and atrophies in the center, ultimately giving rise to a circinate, crescentic or serpiginous plaque, with a smooth, atrophic or calloused center and sharply defined, slightly elevated, seam-like borders. Gyrate patches sometimes develop as a result of the confluence of two or more plaques. The encircling "wall" is grayish or brownish in color,

Fig. 335.—Porokeratosis. (Mibelli.)

Fig. 336.—Porokeratosis, showing early lesions. (Mibelli.)

.1 cm. or more in height, and is often crowned by a linear horny ridge (a characteristic feature which has been emphasized by Respighi).

Minute milium-like, corneous bodies are found imbedded in the floor and on the lateral surfaces and margin of the surrounding wall in some of the lesions. The little masses are brownish or blackish in color, round or oval in shape, and can often be extracted with the aid of a sharp-pointed instrument. The mucous membranes are occasionally attacked, the resulting lesions being white or opalescent in color, and circinate or oval in outline. As a rule subjective symptoms are slight, or entirely absent. The disorder is an exceedingly chronic one, and the lesions develop and spread very slowly.

Etiology.—The majority of the reported cases have occurred in males. No age is exempt. Gilchrist, and Respighi and Ducrey have reported instances in which heredity was apparently an important

Fig. 337.—Porokeratosis. (Courtesy of Dr. Grover W. Wende.)

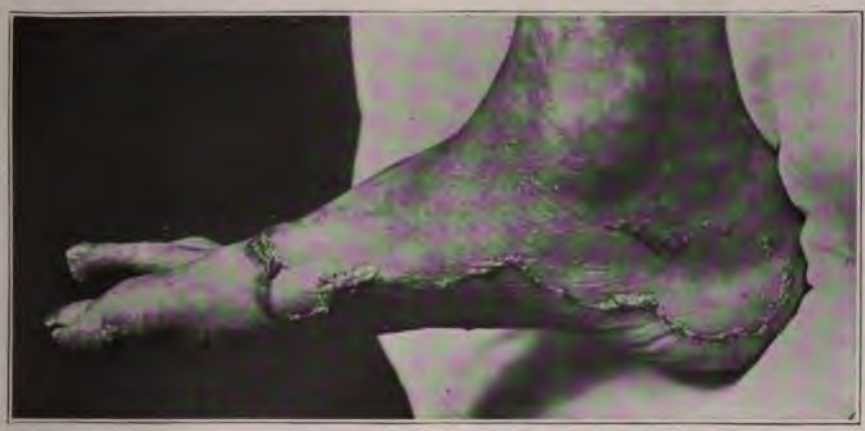

Fig. 338.—Porokerotosis. (Courtesy of Dr. Charles E. Stewart.)

factor. Wende succeeded in reproducing a typical lesion by autoinoculation. Stewart's patient was a German farmer, aged 44, who also suffered severely from arthritis.

Pathology.—The changes are mainly epidermal, and consist pri-

marily of an acanthosis of the surface epithelium to which is soon added a marked hyperkeratosis, particularly in the vicinity of the glandular orifices. There is resulting pressure atrophy which affects not only the underlying rete, but the subjacent papillary layer and the contiguous skin glands as well. The mouths of the sweat ducts are filled with laminated masses of corneous material which ultimately entirely occlude the passages.

Matsumato, who has made a careful and exhaustive study of the histopathology, concludes that we are not justified in assuming that the follicles are implicated in the process to a less extent than the sweat-ducts. Both follicles and sweat-ducts are similarly affected in their keratotic manifestations by the steady expansion of the plaque, whereby the change occurs practically in the same manner (hyperkeratosis and parakeratosis in the follicular openings with formation of heavy plugs and the obstruction and dilatation of the follicles).

Prognosis.—The disorder is usually irregularly progressive in character. Spontaneous involution seldom occurs.

Treatment.—Excision is usually the method of choice, although small lesions can sometimes be eradicated by means of the electric needle.

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ANGIOKERATOMA.

Synonym.—Telangiectatic warts.

Definition.—A disorder which is usually limited to the extremities, and is characterized by telangiectasis and the formation of warty looking nodules at various points along the course of the dilated capillaries.

Symptoms.—Although Wyndham Cottle described a case of what we now believe to have been angiokeratoma as early as 1877, and Crocker, Colcott Fox and Dubreuilh reported examples of the disease as instances of unusual varieties of verruca a few years later, it was not until the publication of Mibelli's classical description, in September, 1889, that a careful and accurate delineation of the clinical and pathologic features of the malady was available. Mibelli's case was

PLATE V.

Angiokeratoma of Scrotum, showing size and distribution of the lesions in a typical example of the disorder.

in a young girl, and the disease, which had been present for about five years, involved the dorsal surfaces of the fingers and toes.

The lesions varied in size from a hemp-seed to the head of a large pin, and were distributed along the course of the superficial capillaries, which were slightly dilated and more prominent than usual. The patient had for several years suffered from recurring attacks of chilblains. Histologically, there were oval or irregularly rounded lacunar spaces in the rete, the majority of which possessed a regularly organized lining. Some of these cavities were partially or completely divided into two or more compartments by thin septa, and the majority of them were filled with serum or coagulated blood. Chronic inflammatory changes were to be noted in the papillary and subpapil-

Fig. 339.—Angiokeratoma of hands. (From a drawing by Max Joseph.)

lary layers, and, in addition, an occasional distended lymph space, partly filled with red cells, was found. The papillae in the vicinity of the lesions were hypertrophied, and the interpapillary plugs in some instances extended far down into the corium. The horny layer, which was greatly thickened, exhibited evidence of serous exudation, with the formation of vesicles and medullary cavities. Numerous normal excretory sweat ducts were present. Mibelli proposed the name "angiokeratoma" for the disease.

Pringle, who next investigated the pathology of the affection, recorded two examples of the disorder. His first patient was an unmarried woman, aged 24. A younger sister was similarly affected. The malady had been present nine years. There was no evidence of

ill-balanced peripheral circulation, such as rosacea, blushing, heat, swelling, or hyperidrosis of the extremities, but there was a history of frequent attacks of chilblains. The lesions were distributed over the dorsal surfaces of the hands and feet, and varied in size from a pinpoint to a split pea. They were dark red in color, and blood exuded when they were pricked with a pointed instrument. A second patient also was a woman, aged 24, and the malady, which affected the hands and feet only, had first appeared twelve years previously. Pringle found thickening of the corneous layer, and hypertrophy of the stratum lucidum, with large, waxy looking masses of eleidin scattered through the latter. The granular layer was very little changed. At the margin of the diseased area the rete Malpighii abruptly became very greatly hypertrophied, the basement membrane remaining constantly present, although broken in some places, and ill-defined in others. The surrounding papillae were enlarged, and proliferative changes were noted in the tips of the elongated interpapillary plugs, but the papillae near the center of the lesion were flattened out, and the sweat ducts, in their course through this region, were malformed, or even wholly obliterated. The rete enclosed several large, irregularly oval spaces, as in Mibelli's case, some of which were filled with blood coagulum, while others were empty. The majority of these cavities were oblong in shape, the long axis being parallel with the surface of the skin, and many were traversed by one or more septa. There were chronic inflammatory changes, consisting of copious leucocytic infiltration, marked fibrosis, and general dilatation of the blood vessels in the papillary and subpapillary layers.

In Fordyce's case the eruption was confined entirely to the region of the scrotum. The patient was a man of 60, and there was no appreciable vascular disturbance other than a double varicocele, which had been present for several years. On the body were several patches of leucoderma, a coincidence which was also noted in Zeisler's case. There was no history of chilblains. Microscopically, the lesions consisted of lacunar spaces, lined with a thin layer of connective tissue, and filled with blood. These cavities occupied the papillary portion of the derma, although some of them were completely enclosed in the rete Malpighii. At various points in the epidermis, which was but slightly thickened, tiny lacunae were found, but while these contained numerous blood-corpuscles, their lining was unorganized, and consisted only of disintegrated epithelial cells. Beneath the lower margin of the rete there was round-cell infiltration, with dilatation of the capillaries, and deposition of blood pigment.

Anderson's patient was a man, aged 39, and there was a history of rectal hemorrhages, and albumin in the urine. There was also present a congenital deformity of the hands, a peculiarity also noted in a mother and sister, and in three out of four of the patient's own children, similar to that seen in Dubreuilh's case. The eruption was distributed over the trunk, limbs and genitals, and the lesions, which varied in size from a pinpoint to a hemp-seed, were of the characteristic purplish-red color, and showed no tendency to coalesce. On sec-

Fig. 340.—Angiokeratoma of scrotum. Moderate magnification.

tion, the papules were found to present a dilatation of the capillaries of the papillary layer, and enlargement of the lumen of the vessel reaching its maximum near the rete, there assuming a more or less spheroidal form, with resulting atrophy, and sometimes complete disappearance of the superjacent Malpighian layer of the epidermis, while the cuticle was either thinned or remained unchanged. The interpapillary processes were hypertrophied. Some of the larger vascular spaces were subdivided by septa.

Judin has described a rather unusual case, occurring in a man 23

years of age. The disease involved the first and second fingers of the left hand, and had been present for almost fifteen years. The corneous layer was thickened, but contained no cavities, and there was no serous exudation in the epidermis. The stratum granulosum was hypertrophied, and some of the papillae greatly increased in size. The lacunae, which lay mostly in the upper corium, were much larger than those commonly found in this malady. The surrounding connective tissue was dense, without infiltration. Elastic fibers appeared in the superficial layers in small amount. The caliber of the sweat gland ducts was narrowed, but the canals persisted. A photograph of the affected hand shows that the lesions more nearly resembled those of angioma than those of angiokeratoma, and, taking into consideration the pathologic findings, it is very probable that the case was an anomalous one of the former disorder.

Zeisler's patient presented typical angiokeratomatous lesions on the hands and feet, and numerous fibromatous and nævoid lesions on the legs, forearms and ears. Pusey and Harris each exhibited typical cases of the disease, involving the feet and hands, before the Chicago Dermatological Society in January, 1917.

The disorder is commonest in individuals of feeble circulation, and the lesions are usually more pronounced during the colder months.

In England the fingers and hands are the sites of predilection, but in this country the scrotum is probably affected more frequently than any other part of the body. Largely through the courtesy of various genitourinary surgeons, particularly Dr. Francis M. McCallum, of Kansas City, I have had an opportunity to study at least a dozen cases of angiokeratoma in this region during the past four years. In the vast majority of instances the patients are the subjects of varicocele and similar congestive disturbances of the venous circulation.

Etiology and Pathology.—The exciting cause of the malady is unknown. Circulatory weakness, as evidenced by varicocele, varicose veins, and a tendency to the development of chilblains, constitute the principal predisposing factor. In all of the five cases that I have studied microscopically there was a marked diminution of the elastic tissue in the affected areas, and it is quite possible that the absence of these fibers hastens the vascular dilatation. The epidermal and corneous changes are purely secondary.

Matsumato, who has made careful clinical and histological studies of the condition, believes that several different types are recognizable:

1. Mibelli's type (angiokeratoma Mibelli).

2. Atypical, symptomatic forms (angiokeratosum or, kerato-angioma).
3. Hyperkeratosis, originating in punctiform angiomata (as in the scrotum).
4. Hyperkeratosis in senile angiomata.
5. Angiokeratoma on the basis of congenital vascular naevi, or vascular tumors.
6. Angiokeratoma on the basis of telangiectasis developing later in life.
7. Transitional forms, similar changes occurring in varicose veins.

Diagnosis.—The lesions are readily differentiated from verrucae vulgares, which they somewhat resemble, by the presence of the subjacent dilated blood vessel.

Prognosis.—The lesions are harmless but persistent, and never disappear spontaneously.

Treatment.—The improvement of the general circulation, and the removal of any venous obstructions that may be discoverable are important measures in the prevention of extension of the disease. The lesions can be readily destroyed by means of the galvanic needle, or with carbon dioxide snow.

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SCLERODERMA.

Synonyms.—Sclerodermia; Sclerema adultorum; Hide-bound disease; Dermatosclerosis.

Definition.—A subacute or chronic disorder characterized by board-like hardening and immobility of the affected skin.

Symptoms.—Three types of the disease are recognizable; a diffuse, symmetrical form, a circumscribed variety (morphea), and a mixed or combination type. Hypertrophy of the collagenous intercellular tissue is common to all.

Diffuse Scleroderma.—The initial manifestations in this form may be those of an edema, or the affected areas may present more or less evidence of fibrosis from the very first. The majority of cases occur in adult life, and the onset of the disorder may follow exposure to cold or wet, and is often accompanied by joint and muscular pains not un-

like those occurring in attacks of acute rheumatism. The affected skin is pinkish in color, smooth and waxy, and pits slightly on pressure. The patches may develop insidiously or rapidly, and vary greatly in size and contour. At the margins they gradually shade off into the sound skin. The sites of predilection are the limbs, face, and upper half of

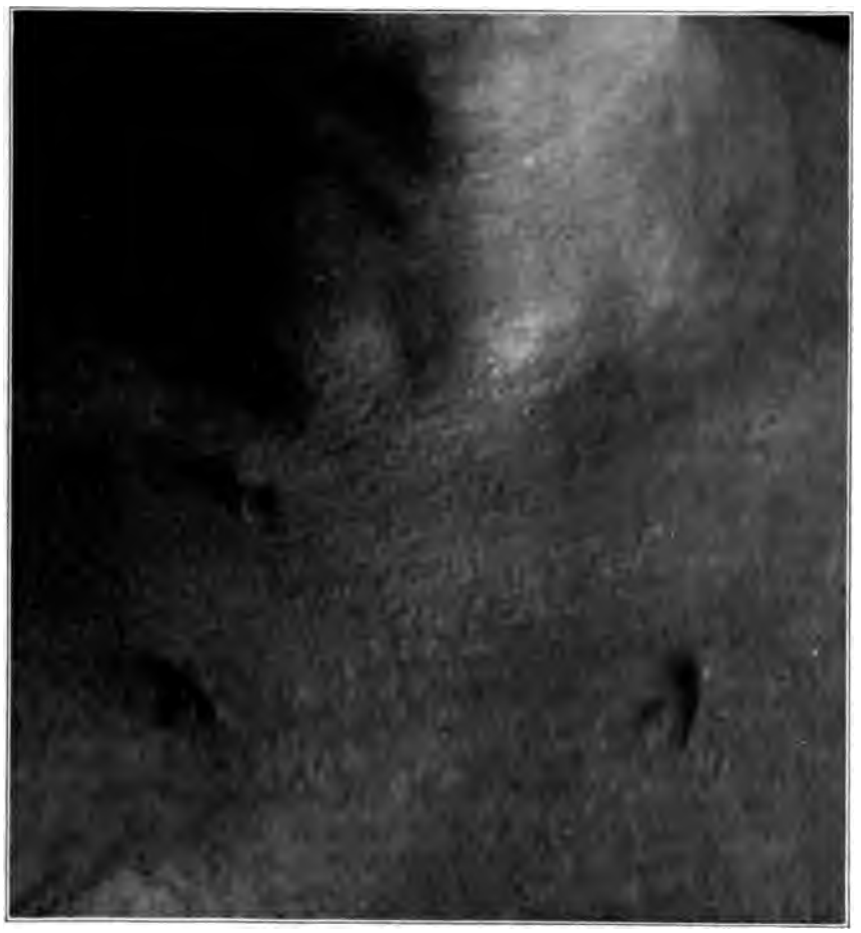

Fig. 341.—Scleroderma guttata of the lichenoid type. (Courtesy of Drs. Wise and Rosen.)

the body. The glandular secretions of the skin are diminished. After the disease has existed for some time the skin becomes hard, yellowish, ivory-like, and firmly adherent to the underlying tissues. As a result of this immobility the face may become mask-like and expressionless, and the hands assume a claw-like appearance *(sclerodac-*

tylia). Olson has reported an interesting case of sclerodactylia complicated with calcareous concretions of the skin. Telangiectases frequently develop on the surface of the lesions, as well as at the margins, and pigmentation is not uncommon. In extensive cases involving the chest, there is marked interference with the respiration, and the movements

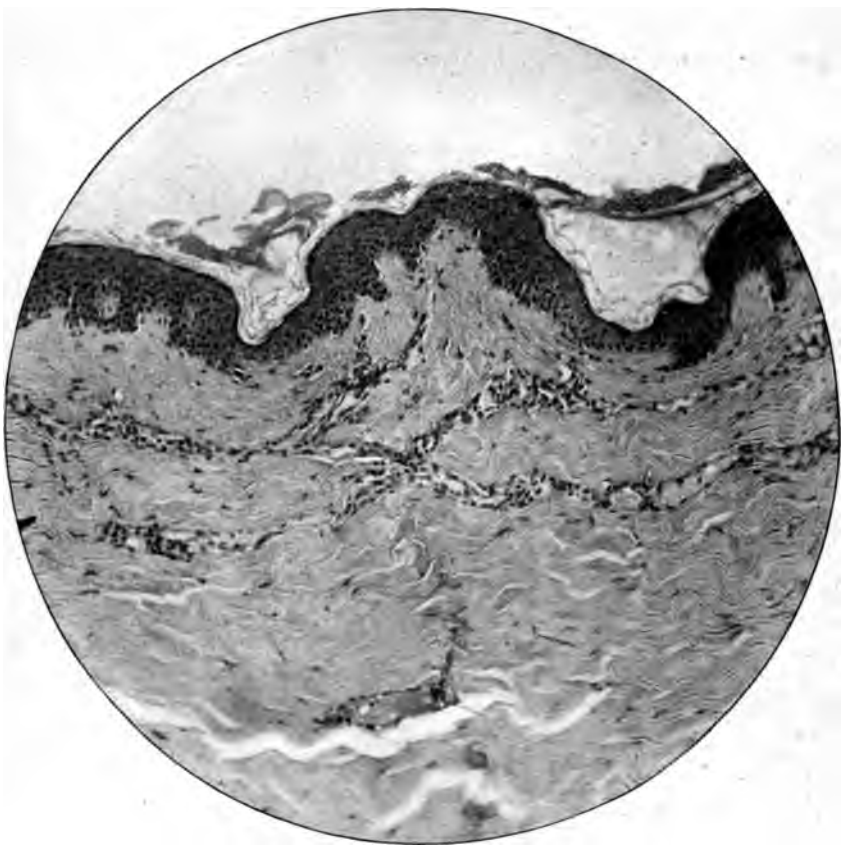

Fig. 342.—Scleroderma guttata of the lichenoid type, showing character of changes in derma. (Courtesy of Drs. Wise and Rosen.)

of the extremities may be interfered with to such an extent that ankylosis results, the patient being rendered practically helpless. The sensibility of the affected part may be increased, but generally is diminished. It is seldom entirely lost. Trophic disturbances of other parts of the body, such as canities, leucoderma, and Raynaud's disease, are occasional accompaniments. As a result of tension, ulceration and even

necrosis sometimes occur over the sites of the bony prominences, the resulting lesions being extremely stubborn and resistant to treatment.

Crocker believes that the majority, if not all, of the edematous cases ultimately become atrophic, and that the primarily hard and infiltrated types seldom if ever undergo this change. I have had opportunity to study only two examples of the edematous variety. In both instances the lesions became atrophic. I once saw an extensive case of the mixed type, however, which presented both hard, sclerodermatous areas and atrophic plaques.

Fig. 343.—Scleroderma, with associated morphea atrophica.

Circumscribed Scleroderma, or Morphea.—This type of scleroderma, which is identical with the keloid of Addison, is characterized by the occurrence of one or more discrete, circumscribed, grayish or yellowish patches, which are usually surrounded by delicate, pinkish or violaceous areolae. Occasionally the patches are elongated and band-like, and, rarely, they may be distributed along the course of a cutaneous nerve. The sites of predilection are the breasts, head, face, and lower extremities. As in the more extensive types of the disorder, the

patches may be the seat of more or less pigmentation, and telangiectases occur so frequently on the surface and at the margins of the affected areas that their presence may be considered a characteristic of the malady. The course of the lesions is variable. The erythematous stage may be prolonged for weeks or months. Vesiculation, with

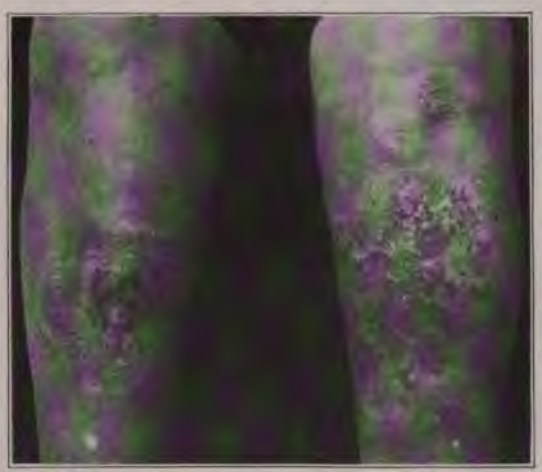

Fig. 344.—Scleroderma of the legs. Ulceration has occurred on both limbs. (Courtesy of Dr. E. J. Angle.)

Fig. 345.—Sclerodactylia in scleroderma. Numerous trophic ulcers.

or without subsequent ulceration, has been noted by Morrow and others, and was present in one case under my care.

The plaques disappear spontaneously, leaving little or no trace, or they may give rise to circumscribed atrophic areas which persist indefinitely.

"White-Spot Disease."—"White-spot disease" is very probably a peculiar variety of scleroderma, somewhat allied to Unna's "card-like" type, in which the lesions are slightly elevated, pinhead- to pea-sized, dead white plaques, many of which exhibit atrophic changes. Histologically, the lesions are practically identical with those of morphea. MacKee and Wise believe that all recorded cases of white-spot disease can be divided into two groups, a scleroderma group and a lichen planus (*Lichen planus sclerosis*) group. They believe that the term "White-spot disease" should be retained, but with the understanding

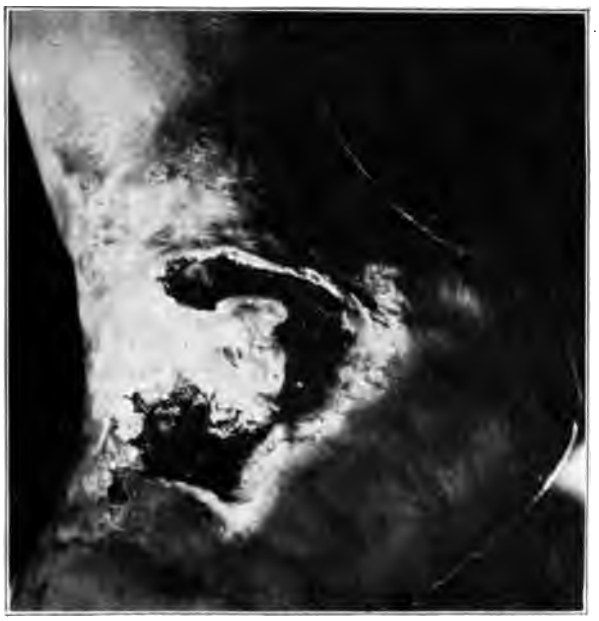

Fig. 346.—Ulceration in a case of scleroderma involving the ankle.

that it represents a certain form of scleroderma occurring clinically as white spots.

Etiology.—The cause of scleroderma is not known. The majority of cases occur between the first and fourth decades of life, although practically no age is exempt. Trauma appears to be a factor in some instances. Associated thyroid disturbance is not uncommon in this as in many other cutaneous disorders, and it is possible that derangement of the internal secretions plays an important part in the causation of some cases.

Of the maladies preceding or accompanying its onset, Raynaud's disease, rheumatism and erysipelas are the most common. Degenerated

areas and similar lesions in the spinal cord have been reported by various investigators, but the findings are not constant and it is probable that the changes occurring in the central nervous system, if es-

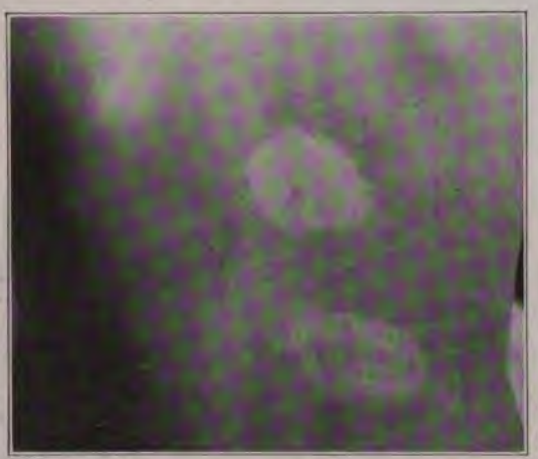

Fig. 347.—Morphea. Typical lesions on the dorsal surface of the trunk.

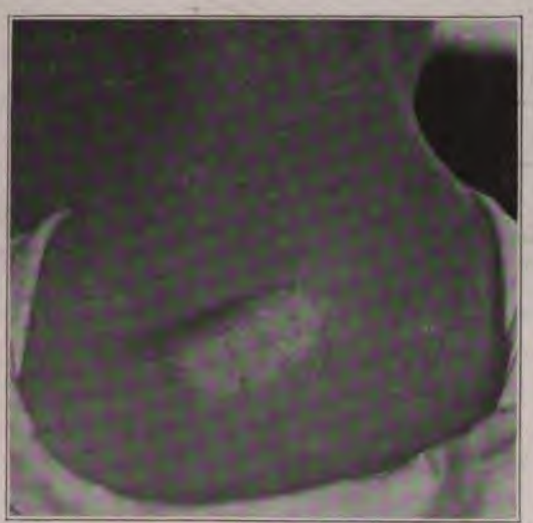

Fig. 348.—Morphea. The lesion is elevated above the general surface, an unusual occurrence.

sential, may be due to any one of several causes. Whitehouse and others have reported a considerable percentage of positive Wassermann tests in cases of this disease, even in instances which presented no

other evidence of lues, and it is possible that this disease may at times give rise to cord disturbances which ultimately result in the development of the characteristic cutaneous changes. The consensus of opinion would indicate that the affection is a trophoneurosis dependent upon changes in the central nervous system, and it is very probable that the conditions leading up to these changes may vary greatly in kind and in character.

Pathology.—In both the diffuse and circumscribed types of sclero-

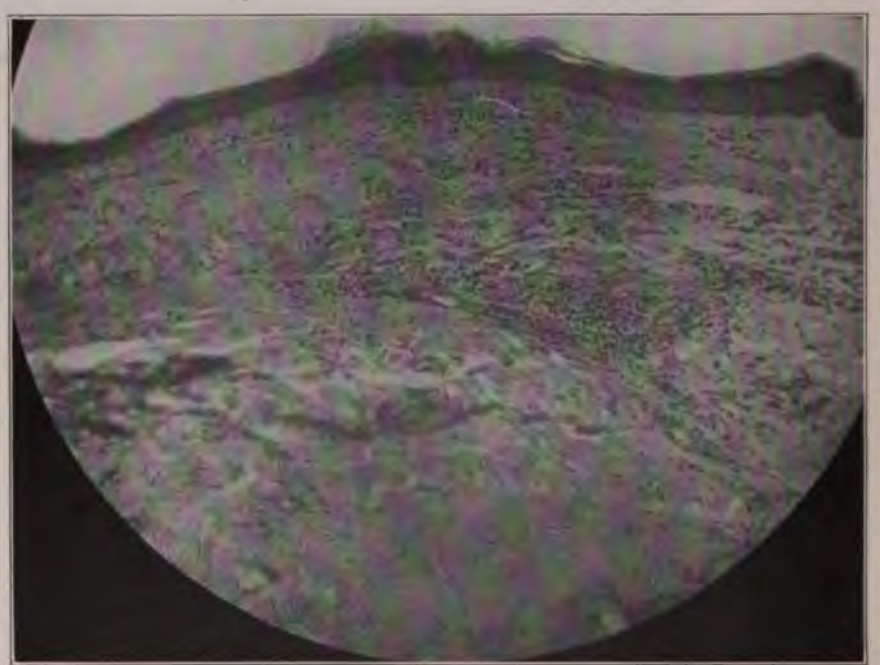

Fig. 349.—Morphea atrophica, showing epidermal atrophy, and changes in derma. Moderate magnification.

derma the essential changes are those of hypertrophy of the pre-existing connective tissue bundles, followed by pressure atrophy of the vessels and epidermic structures. There is a considerable degree of perivascular and periglandular infiltration (lymphoid cells), and the papillae are at first swollen, but later shrunken and flattened. The elastic tissue may be slightly increased in amount. Some authorities hold that the pathologic process is much more complicated in morphea than in the diffuse form of the disease. In my experience (based on the study of three cases of the circumscribed type, two of the diffuse, and one

combination) these differences do not hold, and I believe it would be impossible for any pathologist to separate the two types judging by microscopical evidence alone.

Diagnosis.—The disorder is to be differentiated from Raynaud's disease, vitiligo, and cancer en cuirasse.

In *Raynaud's disease* the character of the earlier manifestations is usually characteristic, and scleroderma involving only the hands or feet is exceedingly rare. Occasionally the two maladies occur simultaneously.

Lesions of vitiligo are changed in color only, and not in consistency.

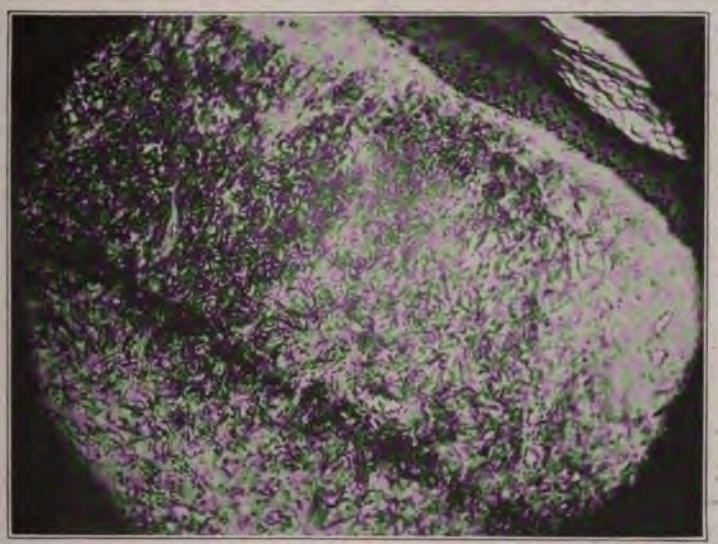

Fig. 350.—Scleroderma, showing collagenous degeneration. Hematoxylin-eosin. Moderate magnification.

Cancer en cuirasse occurs only in females, and always commences in the mammary region. In *leprosy* the associated changes in cutaneous sensibility and absence of induration should serve to prevent confusion.

Prognosis.—The favorableness of the prognosis varies indirectly with the age of the patient and with the extent of the involved area. In extensive cases, and particularly in those presenting other associated trophic changes the outlook is serious. The majority of the circumscribed examples go on to recovery.

Treatment.—Tonics, particularly iron, arsenic, and cod-liver oil, often prove beneficial. Sudden extremes of temperatures are to be avoided. The majority of cases do best in a warm, moist, equable climate.

Thyroid extract is serviceable in a small percentage of instances, and is worthy of a trial in all extensive cases of the disease. Pilocarpine sometimes proves helpful in the persistently dry cases, and English authors strongly recommend salicin and sodium salicylate. Injections of thiosinamine have been suggested by Hebra, but are quite painful, and, in my experience, accomplish little or no good. Electrolysis and the x-rays likewise have proved disappointing in my hands. Systemic massage and passive movement are at times beneficial, particularly in extensive cases of the malady. Of the various local applications, mildly stimulating ointment preparations, thoroughly rubbed in, are best. In the earlier stages, salicylic acid (1 to 2 per cent) in lanolin or in sweet oil may be prescribed, and in the older and more indurated patches the same preparation, with oil of turpentine (10 to 20 per cent) or a similar agent added, may be employed. Mercurial ointment or plaster is of value in some instances. Soap, or chloroform liniment, vigorously applied by means of a flannel cloth, often proves serviceable in cases of long standing. Pick's soap plaster with salicylic acid (5 to 20 per cent) is well worthy of trial. C. J. White has found a mixture of acid fuchsin (5 parts), oil of eucalyptus (25 parts), and lanolin (100 parts) valuable in the treatment of the ulcers which sometimes develop over bony prominences in the affected areas. Recently I have employed radium with benefit in one case of morphea.

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SCLEREMA NEONATORUM.

Synonyms.—Underwood's disease; "Hidebound;" Scleroderma neonatorum.

Definition.—A disease of infancy, characterized by thickening, coldness, and induration of the skin.

Symptoms.—The disorder is an exceedingly rare one, and was first accurately described by Underwood in the first edition of his book on diseases of children. The affection is either congenital or occurs soon

after birth, the lower limbs being the sites of predilection. In the course of a few hours or days the morbid process gradually spreads, until at the end of the first week, it is more or less universal. The affected skin is at first yellowish-white in color, and of leathery consistence, but later assumes a livid tint, and becomes tense, putty-like, and tightly adherent to the underlying structures. In consequence, the infant is unable to move, and its form becomes stiff, motionless, and marble-like, a condition which Northrup has well likened to that of a half-thawed cadaver. The radial pulse is absent, and the respiration slow and labored. There is often associated diarrhea and cardiac weakness. In the majority of instances, death occurs before the end of the first week, but in a very small percentage of cases (as in the one reported by Garrod) the thickening and induration have gradually disappeared, and partial or complete recovery has ensued.

Etiology.—The cause of sclerema neonatorum is unknown. It occurs chiefly in large foundling asylums. The patients are usually emaciated and often prematurely born infants, and malnutrition probably is an important etiologic factor in the secondary cases.

Pathology.—Langer believes sclerema to be due to solidification of fat. Both Parrot and Ballantyne found the rete compressed, and the prickle cells indistinctly outlined with diminution of the subcutaneous fat, and thickening and contraction of the connective tissue. The blood vessels were contracted. In Northrup's case the microscopic findings were absolutely negative, although the skin had been injected prior to the examination.

In material secured from F. G. Harris' case, C. S. Smith found the subcutaneous fat taken from an involved area higher in fatty acid content than that of the normal tissue of the same child. There was no indication of any difference in the oleic acid content of the two fats. Smith therefore concludes that the change taking place was similar to fat necrosis, and not due to the absence of oleic acid.

Prognosis.—The malady generally terminates fatally.

Treatment.—Artificial heat is the most important measure, and the infant should be kept in an incubator. The general nutrition is to be improved by careful feeding, and the cautious use of stimulants.

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EDEMA NEONATORUM.

Synonym.—Edema of the newborn.

Definition.—An affection of the newborn, characterized by subcutaneous edema, with induration.

Symptoms.—In some respects this disorder resembles sclerema, and the two maladies are probably often confounded.

In edema the sites of predilection are the eyelids, and the dependent parts of the body, particularly the hands and feet. The affected parts are waxy looking, and usually feel soft and doughy but they may be quite hard and indurated. Early in the disease the skin is yellowish or livid in color, but later it generally becomes smooth, glossy and shining. There is often associated icterus, and at times purpura, and even gangrene. General anasarca is rare. The temperature is often subnormal. Nephritis is an uncommon complication. There is no sclerosis or ankylosis, as in sclerema, and the characteristic "hidebound" feature of that disease is absent.

Etiology.—The essential cause of edema neonatorum is unknown. The majority of the reported cases have occurred in feeble, poorly nourished infants. Atelectasis is a frequently associated condition. L. Dumas considers the disease analogous to phlegmasia alba dolens, and has reported a case in which bilateral femoral thrombosis was present.

Pathology.—The connective tissue is swollen and edematous, and the cutaneous and subcutaneous fat is particularly dense, and yellowish or brownish in color.

Prognosis.—In the majority of instances the prognosis is unfavorable. The usual duration is from five days to a week, but relapses are common. The principal complications are pulmonary or intestinal.

Treatment.—As in sclerema neonatorum, the maintenance of a normal body heat is essential, and the general nutrition is to be promoted by every possible means. Alkaline diuretics (especially sodium citrate), combined with digitalis, may be employed.

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EDEMA NEONATORUM. *Holt*, Diseases of Children, New York. — *Leon Dumas*, Montpelier med., 1887, ii, S., ix, pp. 25, 109 and 503; Ibid., Montpelier med., 1888, ii, S., x, p. 164.

DERMATOLYSIS.

Synonyms.—Loose skin; Chalazodermia; Cutis laxa; Cutis pendula.

Definition.—A congenital or acquired disorder characterized by hypertrophy and looseness of the skin and subcutaneous tissue.

Symptoms.—The amount of hypertrophy and degree of looseness vary greatly, but in the majority of instances the affected integument is considerably thickened and more or less pigmented, and is so loose-

Fig. 351.—Dermatolysis. (Courtesy of Dr. Fred Wise.)

ly fixed to the underlying structures that it hangs in baggy folds. The consistency of the skin is but little altered, although the hypertrophic process includes the contiguous glands as well as the subcutaneous

connective tissues. The sites of predilection are the face (as in Alibert's case), the neck and shoulders (as in the examples reported by Keen, and by Wise and Snyder), and the thighs (as in a case described by Bell). Subjective symptoms are absent.

Fig. 352.—Dermatolysis. (Courtesy of Dr. Fred Wise.)

The exact status of cutis verticis gyrata, a somewhat allied disorder which affects the scalp, giving rise to ridge-like elevations with intervening furrows, is still in doubt.

Etiology.—Although at times congenital, the disorder is usually acquired. Cases have been reported in which the lesions developed at the site of an injury. In Wise and Snyder's case the patient was also affected with syphilis, but the concurrent presence of the two maladies was probably a coincidence. In some respects the affection bears considerable resemblance to molluscum fibrosum, and the fact that some types of this disorder (molluscum fibrosum gravidarum, for example) occasionally develop as a result of certain systemic conditions may serve to throw some light on the etiology of dermatolysis.

Pathology.—Wise and Snyder found the epithelium to be arranged in distinct folds. The stratum corneum was somewhat thinned, excepting in the furrows formed by these folds. The layers of the stratum lucidum were split into longitudinal planes. The stratum granulosum consisted of one distinct layer of cells. The epithelium in general was of normal thickness, the papillae showing no abnormality, with the exception of the bottom of the furrows, in which the stratum spinosum was greatly atrophied, the intracellular spaces being nearly obliterated, the protoplasm diminished and the nuclei of the cells almost in contact with each other. In the depressions formed by the folds, the epithelium was reduced to five or six layers in thickness; the basal cells, instead of being of the columnar type, were flattened and cuboidal; the papillae in these areas were totally absent. Scattered throughout the deeper layers of the epithelium were a few small mononuclear cells, their nuclei being irregular in shape, their protoplasm failing to take the stain.

No distinct subepithelial basal layer was present. The pars papillaris showed marked edema; the blood vessels were widely dilated, some filled with blood cells, others with serum. The lymph spaces were widely dilated. The connective tissue was made up of fine, swollen and homogeneous fibers, staining poorly. This edematous tissue recalled the myxomatous structure forming the umbilical cord. A few plasma cells and a few small fibroblasts were scattered throughout this layer, the former being more numerous around the blood vessels. There was very little endothelial proliferation. There was a general decrease in the amount of elastic tissue, being more diminished beneath the atrophied portions of the epithelium.

The pars reticularis also was edematous, the blood and lymph vessels showing the same conditions as in the layer above. The connective tissue fibers were somewhat homogeneous, widely separated and exhibited poor staining properties. These myxomatous connective tissue bundles were hypertrophied and between them were seen strands

of similar structure, disposed in oblique and transverse fashion. The elastic tissue was diminished, edematous, and showed multiple fractures. The walls of the blood vessels also showed a diminution of elastic tissue. The nerve fibers showed no changes, save those of edema. The hair follicles, sebaceous, and coil glands were hypertrophied. The arrectores were edematous; the panniculus adiposus was entirely absent.

Diagnosis.—The condition is to be differentiated from the relaxed tissues following pregnancy and the removal of large abdominal tumors, and from cutis hyperplastica (q.v).

Prognosis and Treatment.—The disease is at first progressive, but after reaching a certain point it generally remains stationary. Aside from the inconvenience to which its presence gives rise, the patient's comfort and general health are not affected. The treatment is surgical.

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ELEPHANTIASIS.

Synonyms.—Pachydermia; Elephantiasis Arabum; Hypersarcosis; Bucnemia tropica; Elephant leg; Barbadoes leg.

Definition.—A chronic, endemic or sporadic disorder of the skin and subcutaneous tissues characterized by hyperplastic changes which ultimately result in enormous increase in size of the affected part.

Symptoms.—The disease commonly affects one of the lower extremities (usually the right) or the genitalia, but it may involve the upper extremities, the face, the ear, and even portions of the trunk. From an etiologic standpoint two types of the malady are recognized. One variety, which is generally of endemic occurrence, usually develops as a result of infection with the filaria sanguinis hominis, and the other, which includes the majority of the sporadic examples, is a sequel of a recurrent, deep-seated cellulitis of bacterial origin.

The onset of an attack in the filarial type is generally marked by severe systemic disturbance, with elevation of temperature *(elephantoid fever)*. Following or accompanying this, the affected part becomes inflamed, swollen and tender, often with more or less oozing of clear or milky serum. The attacks are recurrent in character, and vary considerably in duration and frequency, as well as in severity.

Following each exacerbation, however, the affected part is sensibly increased in size, until finally it may assume enormous proportions. There may be ten to a score or more of these attacks in a year and

Fig. 353.—Elephantiasis of the scrotum, before operation. (Courtesy of Dr. A. M. Fauntleroy, U. S. Navy.)

after each the swelling and induration are greater, although the fever and general disturbance are less with each succeeding exacerbation. At first the overlying skin is edematous, doughy and pits on pressure, but as a result of the long continued inflammatory process it becomes

hardened and indurated and may assume a rugose appearance. Eczema often develops as a result of irritation from the decomposing secretions, and in cases of long-standing, ulceration is not uncom-

Fig. 354.—Elephantiasis of scrotum, following operation. (Courtesy of Dr. A. M. Fauntleroy, U. S. Navy.)

mon. During the intervals, the subjective symptoms, aside from the pain which results from pressure and from traction, are remarkably trivial in character. In both varieties the progress of the disease is slow, but progressive. There is usually associated involvement of the

contiguous lymphnodes, particularly in the scrotal and leg cases. Although the condition may affect only one part, the involvement may be quite extensive and even general (Felkin).

The hypertrophy varies greatly in degree. There may be only moderate hyperplasia of the skin and subcutaneous tissues, with dila-

Fig. 355.—Elephantiasis of the scrotum. The patient is a Cannibal chief. (Courtesy of Dr. A. M. Fauntleroy, U. S. Navy.)

tation of the superficial lymphatics, and more or less oozing of serum during the exacerbations; or the increase in size may be enormous (Crocker cites an instance of elephantiasis scrotum in which the or-

gan attained a weight of 224 pounds). In a case of elephantiasis of the leg referred to me by Dr. M. W. Pickard, of Kansas City, the circumference of the affected calf measured 80 cm.

Fig. 356.—Elephantiasis of scrotum, showing result of operation. (Courtesy of Dr. A. M. Fauntleroy, U. S. Navy.)

Lymph-scrotum, or *nævoid elephantiasis*, is characterized by moderate enlargement of the part, with more or less milky exudate on the surface of the skin during the febrile attacks. Manson holds that ele-

phantiasis, lymph-scrotum, and chyluria are but clinical variants of the same pathologic condition.

Telangiectatic elephantiasis is a rare congenital disorder characterized by a hypertrophy which is largely vascular and which Virchow ascribes to excessive nutrition.

Etiology.—The disease occurs endemically in practically all tropical countries, and is more common in the dark races. Males are more susceptible than females (3 to 1), and the affection is commonest in young adults. Although filarial infection is an important causative factor in many instances, its presence is not essential in all cases

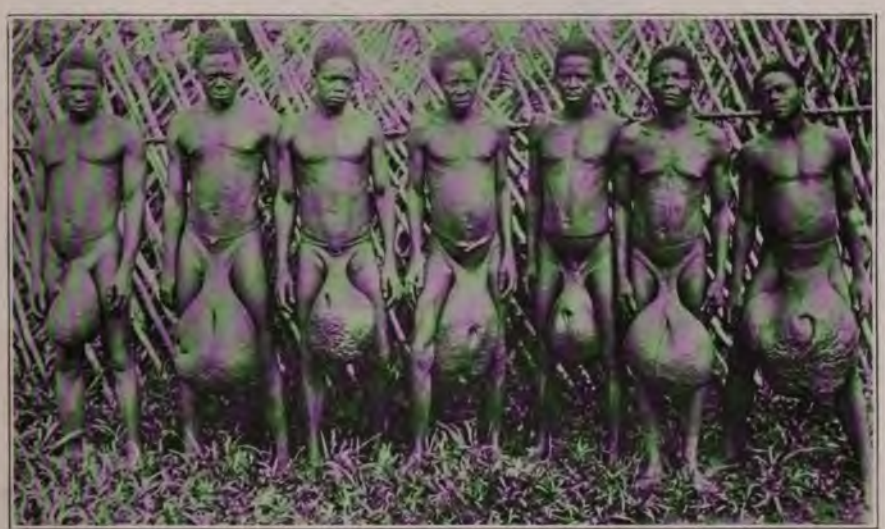

Fig. 357.—Six cases of elephantiasis of scrotum. The first man has inguinal hernia. (Courtesy of Dr. Louis F. Joggard.)

as Shattuck has shown. Any chronic or recurring inflammatory process which results in obstruction of the lymphatic or venous circulation will ultimately result in hypertrophy and thickening of the affected part.

Pathology.—The lymphatic obstruction in the filarial cases is due to the presence of both the parasites and their ova, particularly the former. As Lewis has indicated, the obliteration of the lymph vessel may result from the presence of the tumor containing the parasite, or by embolic plugging of the capillaries by the embryos. The ova which are discharged into the peripheral lymph vessels by the female filaria, lodge in the lymphnodes, where they hatch. The vast major-

ity of sporadic cases result from infection with various strains of streptococci, particularly Fehleisen's organism. Instead of undergoing complete resolution the lesions heal incompletely, and the resulting

Fig. 358.—Elephantiasis of lip. (Courtesy of Dr. H. C. Baum.)

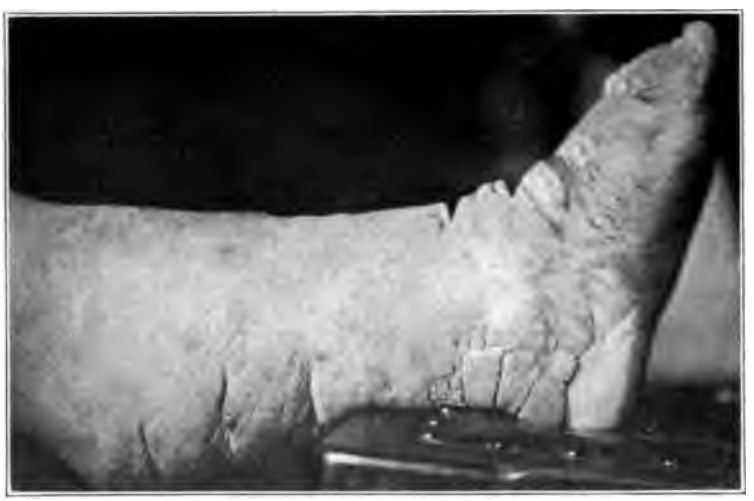

Fig. 359.—Elephantiasis. (Courtesy of Dr. M. W. Pickard.)

changes in the connective tissue and in the vessels render the part particularly susceptible to repeated attacks from the organisms which, though attenuated, are still present in considerable numbers (Unna).

Histologically, the principal change is found in the corium and sub-

cutaneous tissues, and consists of connective tissue hypertrophy, with consequent thickening of the derma, and more or less acanthosis. The papillae are increased in size, and both the blood and lymph vessels enormously distended. In many areas the collagenous tissue is almost gelatinous in character, with fine fibrils and many nuclei, and stains faintly and unevenly. In rare instances the nerves and even the bones may share in the general hyperplasia.

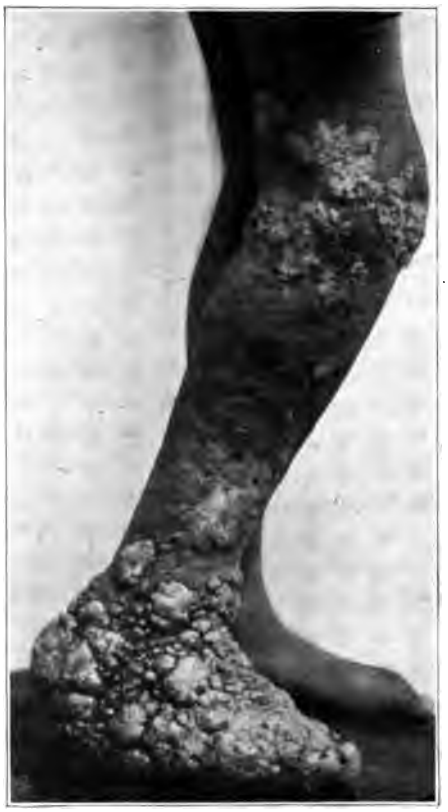

Fig. 360.—Elephantiasis of unusual type. (Courtesy of Dr. John W. Perkins and Dr. W. C. Willitts.)

Diagnosis.—In the filarial cases, the elephantoid fever and other constitutional symptoms, together with the erysipelatous involvement of the skin in the affected area, are fairly distinctive. Ultimately, the course of the disease, and the characteristic enlargement will dispel all doubt. The blood should be examined (the specimen being

secured at night) for the filaria. Sporadic cases are to be differentiated from erysipelas of the ordinary type, and from ichthyosis hystrix.

Prognosis.—In so far as life is concerned, the outlook is good, but the disease is a chronic and persistent one, and treatment other than surgical is unsatisfactory.

Treatment.—The constitutional treatment of the filarial cases is that of the parent disorder. Removal to a cool or temperate climate is usually followed by improvement, even in cases that are fairly well advanced.

During the acute attacks local applications (lead and opium lotion, ichthyol ointment—10 per cent—or gauze dressings moistened with a saturated aqueous solution of magnesium sulphate) may be employed. Rest, with elevation of the affected part, is advisable. Later, galvanism may be tried. The use of a Martin or similar rubber bandage is advised by Hardaway, Crocker and others in cases affecting the limbs. A heavy elastic cotton bandage is even better, as it supplies the necessary pressure, and yet allows the escape of the natural secretions. The part is to be kept clean, and massage, followed by an alcohol rub, applied daily. The removal of long, wedge-shaped pieces of skin and subcutaneous tissue has been suggested by Curl, who has employed the method with very satisfactory results. In cases involving the genitalia surgical interference also is the method of choice. Ligation of the main artery leading to the part is sometimes advisable, particularly when the extremities are affected.

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ACROMEGALY.

Definition.—A chronic disorder characterized by hypertrophy of the bones and soft parts, particularly of the face and the extremities.

Symptoms.—This rare affection, which was first accurately described by Paul Marie, in 1886, is of more interest to the neurologist than to the dermatologist. The onset of the disease is insidious, and its course progressive. The parts of predilection are the face, particularly the lower jaw, the malar bones, and the supraorbital promi-

nences, and the distal ends of the extremities, although no region is exempt. The parts are so enormously hypertrophied as to be almost giant-like in character. The skin is thickened, and often exhibits areas of pigmentation. Hypertrichosis may be present.

Etiology.—Marie believed the disorder to be due to functional derangement of the pituitary body. The consensus of opinion at this time indicates that the affection is dependent upon a disturbance of this gland, with resulting hyperactivity either following disease of

Fig. 361.—Acromegaly. (Courtesy of Dr. Lindsay S. Milne.)

the organ itself, or as a result of pressure. Histologically, there is thickening of both layers of the skin, with collagenous hypertrophy of the derma and pigmentation of the rete.

MYXEDEMA.

Synonyms.—Gull's disease; Cretinoid edema.

Definition.—A constitutional disorder, due to thyroid insufficiency, and characterized by cutaneous edema, with consequent thickening and induration of the skin.

Symptoms.—The disorder was first accurately described by William Gull in 1873, and is a comparatively rare affection. It occurs chiefly in women, usually after the fortieth year, and may be either acute or chronic. The onset is usually gradual, and is characterized by anemia and general weariness. In the course of a few days or weeks, these symptoms are followed by mental dullness and listlessness, and the characteristic cutaneous changes. The skin becomes dry, rough, yellowish, and swollen and does not pit on pressure. There is more or less furfuraceous scaliness, and the sweat secretion is diminished. The regions commonly affected are the face, particularly the lips, nose, and eyelids, and the neck and hands. The joints also are frequently involved. The swollen, mask-like face, everted lips, and expressionless eyes, together with the gigantic, shapeless hands, present an appearance which is characteristic and distinctive. There may be some associated pigmentation of the affected areas. The thyroid gland is either atrophic and cannot be palpated, or fibrous and hard. Neuralgia and headache are commonly present, and nephritis and diabetes mellitus are frequent complications.

Etiology.—The disease develops as a result of insufficient thyroid secretion, and follows ablation or atrophy of the gland.

Pathology.—The primary involvement is probably neurotic, and the cutaneous changes secondary. There is a widespread obliterative endarteritis of the dermal vessels, and extensive collections of mucin-like fluid are scattered through this region.

Treatment.—Thyroid extract is a specific. It should be employed with caution, as untoward results sometimes follow its administration. The initial dose should not be greater than 2 grains (0.13 gm.), after each meal, to be gradually increased until the physiological effect is secured. The patient should be kept under close observation.

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CUTIS HYPERELASTICA.

Synonyms.—Elastic skin; India rubber skin.

Definition.—An inherited or acquired disorder characterized by excessive elasticity of the skin.

Symptoms.—The affection was first described by Turner, in 1736, and has since been studied by Kopp, Ohmann-Dumesnil, Seifert, Unna, Williams, and others. In the majority of instances the skin of

the affected individuals has been smooth, soft and apparently somewhat thinned. It is extraordinarily supple and elastic, however, and when a fold is drawn out from the body and suddenly released, it returns to its original position with an audible snap, like that of a rubber band. The elasticity is generally confined to certain regions but may be general.

Etiology and Pathology.—The condition is probably a congenital one and may be inherited (Kopp's two cases occurred in a father and son). Histologically, Williams and Unna found the elastic fibers increased in length but not in number, and the connective tissue bundles likewise were considerably elongated, and of somewhat smaller diameter than normal. The capillaries, lymph vessels and lymph spaces were dilated, and both the blood vessels and nerves pursued an abnormally winding course. Williams believed that the muscular elements of the skin were unusually numerous, and Unna lays great stress upon the splitting up of the collagenous substance.

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CLASS V.—ATROPHIES.

ATROPHIA SENILIS.

Synonyms.—Senile atrophy; Atrophia cutis senilis.

Symptoms.—Senile changes in the skin usually develop slowly, and consist in the main of loss of subcutaneous fat, and thinning of both corium and rete. The manifestations of atrophy are seldom pronounced before the fiftieth year, although in occasional instances they are present comparatively early in life.

The skin becomes yellowish or brownish in color, thin, harsh and inelastic, and is frequently the seat of brownish or blackish pigmented lesions which ultimately develop into seborrhœic keratoses (q.v.). The changes are usually most marked on the face, neck, the dorsal surface of the hands, and the legs. Occasionally the affected areas instead of being dry, rough, and harsh, are soft, pliable and shiny, and are marked by the presence of whitish, atrophic spots or streaks. Telangiectases are not uncommon, particularly on the flush areas of the cheeks, and along the sides of the shins. The appendages, particularly the hair follicles and shafts, also are affected, and the papillae are flattened and may disappear altogether. Itching is a not infrequent symptom, especially in winter, when the coil glands are inactive and the skin is unusually dry and harsh.

Etiology and Pathology.—Unna holds that senile changes in the skin are degenerative in nature, and not due to simple atrophy, and the tinctorial characteristics of the connective tissue, together with the relatively able proliferative power of the epithelium in the aged, strongly support this belief. As Pusey has stated, the cutaneous changes are most marked in individuals who are thin, and have little subcutaneous fat and relatively inactive sudoriferous systems. Histologically, the coil glands are apparently but little affected, the sebaceous glands are inactive and occasionally dilated, and the connective tissue bundles in the derma are shrunken and stain poorly. In the pigmented areas the coloring matter is found both in the connective tissue interspaces and in the walls of the vessels.

Treatment.—The condition can be ameliorated, but is not prevent-

able or curable. The use of rose water ointment and similar emollient applications, and the avoidance of hard water and highly alkaline soaps are important measures.

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ATROPHIA SENILIS.—*Unna*, Histopathology. — *Pusey*, Principles and Practice of Dermatology, New York, 1911, p. 789.

GLOSSY SKIN.

Synonyms.—Atrophoderma neuriticum.

Symptoms.—It is largely to the scholarly contributions of Mitchell, Moorehouse and Keen that we owe much of our knowledge of the clinical symptomatology of the condition known as glossy skin. The sites of predilection are the extremities, particularly the fingers. The affected skin is at first reddish or purplish in hue (Paget has likened its appearance to that of a chilblain), but later it becomes whitish or grayish in color, glossy, and shining, the surface somewhat resembling that of an atrophic, highly polished scar. Fissuring and ulceration are not infrequent, and atrophic changes are commonly present in the appendages of the affected part. In addition to the alopecia, and the dryness or excessive moisture which is also sometimes present, the nails are generally involved, and become curved both transversely and longitudinally. There is usually more or less accompanying neuralgic pain (causalgia).

Etiology and Pathology.—The disease is invariably secondary to a neuritis, and the nerve inflammation may follow trauma (such as that resulting from a gun shot wound), disease of the cord (myelitis), or some constitutional disorder (gout or rheumatism). Watson's case, cited by Crocker and by Stelwagon, was apparently spontaneous, but in many respects it resembled Raynaud's disease more than it did atrophoderma neuriticum.

Prognosis and Treatment.—According to Mitchell, the condition ultimately disappears spontaneously in the majority of instances. Tonics, particularly arsenic and iron, are sometimes indicated. The limb should be kept warm, and precautions taken to guard against sudden changes of temperature. Ulcerated areas should be occasionally painted with an aqueous solution of silver nitrate (10 per cent), and oily dressings applied. Orthoform (10 per cent) in rose water ointment occasionally proves both comforting and beneficial, but care must be observed lest it set up a gangrenous dermatitis. For the relief of the pain, the constant application of either cold or hot water should be tried.

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KRAUROSIS VULVAE.

Definition.—A chronic disorder involving the external genitalia of women, characterized by atrophy, shriveling and contraction of the parts.

Symptoms.—The malady was first described by Breisky, in 1885. It is a disorder of adult life, and often commences as a localized pruritus. In the course of a few weeks or months the atrophic changes become apparent. The labia minora, præputium clitoridis, and the clitoris are the parts commonly involved, and their surface becomes grayish, dry and hard. As a result of the shriveling and contraction the vaginal orifice becomes constricted, and its surface is frequently the site of leukokeratotic plaques. The pruritus generally disappears after the disease is well advanced. Carcinomata have developed in a few instances.

Etiology and Pathology.—The exciting cause is unknown. In a few instances the disorder has followed eczema or other inflammatory disease, and Hyde and Montgomery refer to cases in which there was a striking resemblance to indolent epithelioma of the penis. The same authorities have found the lesions co-existing with well marked scleroderma of the shoulders. Histologically, the atrophic changes involve both the derma and epidermis, as well as the skin glands.

Prognosis and Treatment.—The affection is an exceedingly chronic one, and unresponsive to treatment. Surgical measures—curettage, cauterization, or even excision (as recommended by Baldy and Williams)—promise the greatest amount of relief. The x-rays or radium may be tried in those cases presenting areas of leukoplakia.

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XERODERMA PIGMENTOSUM.

Synonyms.—Atrophoderma pigmentosum; Melanosis lenticularis progressiva; Lentigo maligna; Angioma pigmentosum et atrophicum.

According to Corlett, it seems probable that Wilson referred to this

Fig. 362.—Section from a leucokeratotic patch in a case of kraurosis vulvæ. Moderate magnification.

disease in his description of xeroderma, or "parchment skin," under the heading of atrophia cutis, but it was not until the publication of Kaposi's accurate description of the affection several years later, that general attention was called to it. Since then more than 110 cases of the disease have been reported from various parts of the world.

Fig. 363.—Xeroderma pigmentosum. Face and hands are involved. (Courtesy of Dr. J. B. Shelmire.)

Symptoms.—In the vast majority of instances the disorder appears very early in life, often before the end of the first year, and frequently following exposure to strong sunlight. The sites of predilection are the face and scalp, the neck and forearms, and the dorsal surfaces of the hands. Unna separates the clinical course into three stages.

The first, or stage of erythrodermia, corresponds to the time when the child gets freely outdoors, and is characterized by mottling of the skin, diffuse capillary hyperemia, slight puffiness, and some roughening of the surface. This stage is that of inflammatory irritation by the actinic rays.

In the third and fourth years of life pigmentation becomes more apparent—in small freckle-like spots, along with active scaling, and the transient appearance of flat warts, while the hyperemia and edema are slightly diminished. Hyperemia of the conjunctiva becomes pro-

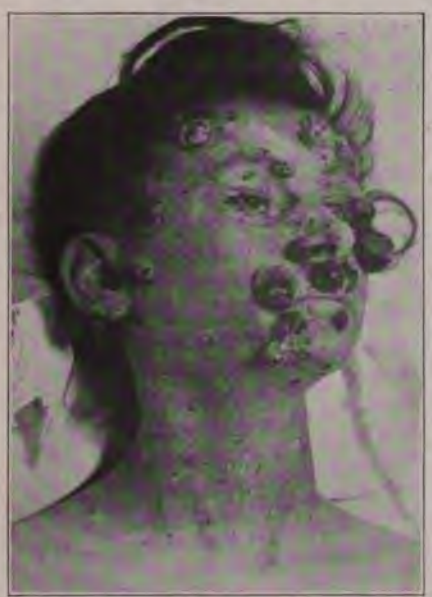

Fig. 364.—Xeroderma pigmentosum. (Courtesy of Dr. A. J. Markley.)

Fig. 365.—Xeroderma pigmentosum. Courtesy of Dr. F. H. Carlisle.)

nounced, and there is more or less photophobia. This is the stage of reaction.

In the third and last stage, white, mother-of-pearl-like spots often permeated or margined by dilated capillaries, appear between the pigmented areas, the warty lesions become more numerous and pronounced, and in the course of months or years, many become converted into carcinomata. The pigmentation varies from a pale yellow to sepia in color, and by coalescence of the patches areas of considerable extent may be involved. The activity of the coil glands is somewhat lessened, but the sebaceous glands are little affected. As a result of

the sclerosis, contractures of the nose and mouth are not uncommon, and ectropion, occasionally with ensuing ulceration of the cornea, results. The course of the disease may be rapid and progressive, but

Fig. 366.—Xeroderma pigmentosum, showing characteristic lesions on face. (Courtesy of Dr. J. B. Kessler.)

usually there are periods of comparative quiescence, and the patient may survive for many years (as in cases reported by J. C. White and by Crocker). Ultimately, however, he succumbs to carcinomatosis.

Although usually developing in infancy or early childhood, in rare

instances the disease may begin in adult life. In the majority of the cases that have been reported as commencing after the age of fifty, however, the accuracy of the diagnosis has been open to question.

Etiology.—Congenital predisposition is the most important factor. Two or more members of a family are frequently affected (7 brothers in a family of 13 reported by Rüder). In many respects the disorder

Fig. 367.—Xeroderma pigmentosum. (Courtesy of Dr. J. B. Kessler.)

simulates a precocious type of "sailor's skin." Corlett's belief that the condition is dependent primarily and essentially on an inherited susceptibility or predisposition, which is called into action by certain rays of the solar spectrum, is very probably the correct one.

Pathology.—According to Councilman and Magrath the most common changes in the skin consist of atrophy of the corium and its ap-

pendages and of the epidermis, combined with excessive formation of the horny layer, and the follicular formation of pigment. The atrophy of the corium is at the expense of the connective tissues. The elastic fibers show a general increase and a follicular formation of large masses of convoluted fibers. In places there were horny excrescences and tumor-like masses of epithelium. The tumor formations do not penetrate below the corium and there were no metastases either in the lymphnodes or corium. The pigment was intracellular and autochthonous.

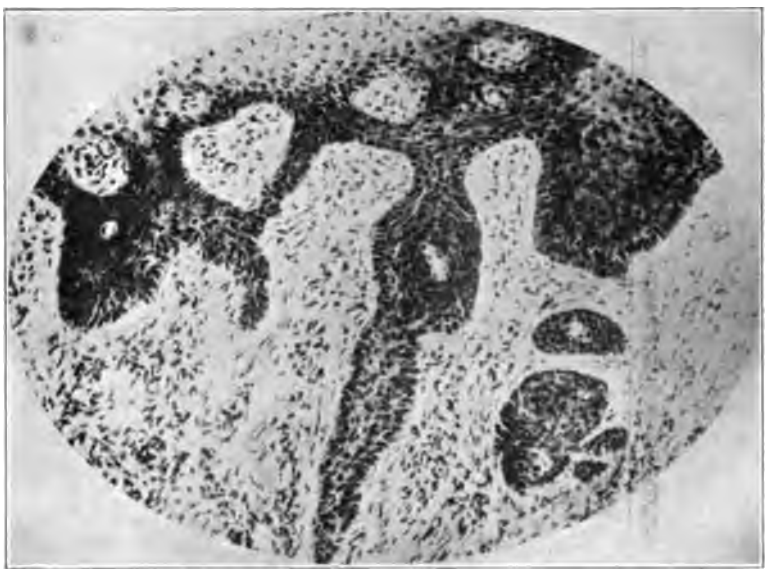

Fig. 368.- Xeroderma pigmentosum, showing proliferation at base of a keratosis, and the sharp separation of the proliferating epithelium. (Courtesy of Professor W. T. Councilman.)

Diagnosis.—If the characteristic features of the disease (pigmentation, followed by roughness and scaliness of the skin, telangiectasis, and the development of malignant growths), and the usual tender age of the patient are borne in mind a mistake in diagnosis is hardly possible.

Prognosis.—In the vast majority of instances the outlook is exceedingly grave. The number, and the rapidity of development of the tumors are to some extent suggestive of the future course of the disease.

Treatment.—Of the various constitutional remedies suggested, none

are particularly valuable. Hyde and Montgomery, Ranvière, and others report some improvement following the employment of the x-rays, and it is probable that radium also would prove a helpful agent in combating the disease.

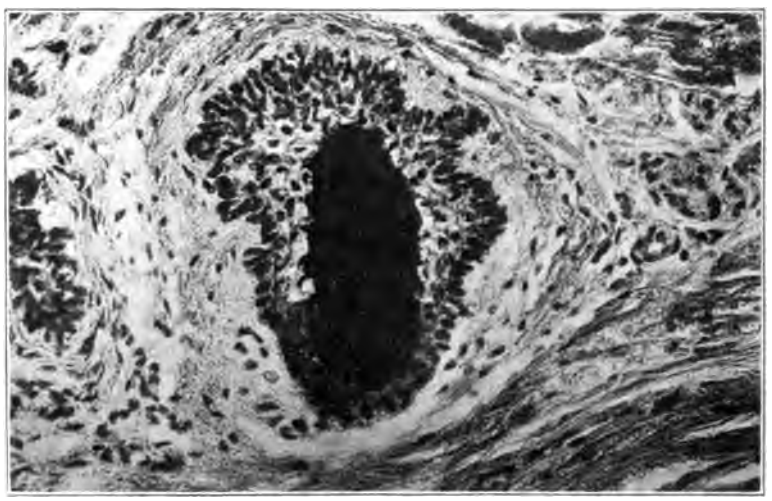

Fig. 369.—Xeroderma pigmentosum, showing proliferation of the cells of the sheath of a hair follicle. (Courtesy of Professor W. T. Councilman.)

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STRIAE ET MACULAE ATROPHICAE.

Synonyms.—Atrophia striata et maculosa; Atrophic lines and spots; Striae patellares; Striae et maculae distensae (some cases).

Symptoms.—Symptomatic atrophic striae are not uncommon following mechanical overstrain, as in pregnancy (lineae gravidarum), tumors, and ascites. There is also a less familiar type, characterized by the presence of linear and macular atrophic spots, which is apparently idiopathic. While possibly neurotic in some instances the possibility of the lesions being due to either trauma or hypertension

can seldom be excluded. Shepherd, Northrup, Bunch, Fisher, and others have reported the occurrence of peculiar, transverse atrophic lines on the legs, particularly in the patellar region, of patients, usually children, who were recovering or recently had recovered from typhoid fever. The lesions were pinkish or purplish in color, and painless, and there were no perceptible alterations in sensation on the surface.

Histologically, Bunch found in a late lesion which had lost its pigmentation alterations in the elastic tissue, characterized chiefly by the diminution and new parallel arrangement of these fibers, the rearrangement having been brought about at the expense of the transverse elastic fibers, which had ruptured and retracted to the edge of the lesion. At the margins of the lesions the elastic tissue appeared denser than normal, probably a result of the presence of the broken, retracted fibrils. The changes were best marked in the reticular stratum. Bunch was unable to demonstrate the involvement of any trophic nerves and the reflexes were normal. He concluded that the rupture of the elastic fibers is probably due to gradual stretching or tension rather than inflammation.

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ATROPHODERMIA RETICULATA SYMMETRICA FACIEI.

Under the title of atrophodermia reticulata symmetrica faciei, Pernet has described a disorder involving the flush areas of the cheeks, which commenced as a slight desquamative dermatitis (following measles in one instance), the affected areas ultimately becoming slightly reddened, and having a honeycombed appearance. On close examination with a lens a superficial atrophy of the skin can be made out. The picture is that of a fine network, the meshes of which form a raised, delicate tracery enclosing slightly depressed, atrophic areas. In many respects the disorder resembles one which I described some years ago as "a symmetric dermatitis of the face with associated atrophy."

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DIFFUSE IDIOPATHIC ATROPHY OF THE SKIN.

Synonyms.—Atrophia maculosa cutis; Acrodermatitis chronica atrophicans (some cases); Dermatitis chronica atrophicans; Erythromélie.

According to Irvine, Buchwald was the first to describe an authentic case of idiopathic atrophy of the skin, and a few years later Kaposi called attention to the fact that the atrophy in these cases was probably not primarily an atrophy, but rather a dermatitis passing into an atrophy. Of the various forms of classification suggested, that of Finger and Oppenheim is the most exhaustive and comprehensive. These authors exclude all cases of secondary or deuteropathic atrophy, as well as congenital and senile atrophy, striae et masculae distensae, and atrophy following lupus erythematosus, leprosy, and scleroderma.

First, they would place dermatitis atrophicans diffusa or universalis, which applies to those cases involving large areas or the entire body; and second, dermatitis maculosa, in which only small circumscribed areas are involved (and which correspond in the main to the macular types of striae et maculae atrophicae). As Finger and Oppenheim have suggested, many cases that formerly were classed among the idiopathic atrophies can now definitely be placed in groups of their own, in other words, the lesions are symptomatic rather than idiopathic. Sudden extremes of temperature appear to constitute an important etiologic factor in many instances.

Etiology and Pathology.—Ehrman found a perilymphangitis in some of the cases investigated, and believes the malady to be of traumatic, infectious origin, but this hypothesis falls far short of explaining the causation of a large percentage of the cases. Neumann, Zinsser, Blaschko, Heller, and others have suggested a trophoneurotic origin, both because of the usual symmetric distribution of the affected areas and the fact that the presence of atrophic changes has occasionally been noted in the contiguous nerve trunks. Decrease of elastic tissue is often found without apparent exudation or proliferation, a fact upon which Oppenheim places great stress. Orth, Lubarsch, and others claim that the tubercle bacillus and its toxin possess an affinity for these fibers, but whether the action is direct, or secondary to connective tissue increase, remains to be proved.

Finger and Oppenheim consider the macular and diffuse dermatitis atrophicans cases to be due to an internal causative agent acting on a predisposed skin, and the acrodermatitis atrophicans cases to be

due to an external causative agent (particularly mechanical, chemical and thermal injuries), acting on a predisposed skin.

Diagnosis.—The disorder is to be differentiated from scleroderma, particularly scleroderma of the edematous type. Arndt, who has investigated the question carefully and exhaustively, holds that confusion can occur only in the earlier stages of the disease—an opinion which is shared by Finger and Oppenheim. Herxheimer and others hold that the two maladies are often practically indistinguishable in the atrophic stage. Judging from the result of my own studies I should say that some cases of acrodermatitis chronica atrophicans, as the disease was originally described by Herxheimer and Hartmann, cannot be differentiated from the edematous form of scleroderma at any stage. In fact, the two affections are very probably identical.

Prognosis.—The general health is usually but little affected. The progress of the disease is generally slow, but progressive up to a certain point, when it remains relatively stationary. The changes are more or less permanent, regression seldom, if ever, taking place.

Treatment.—Therapy is symptomatic and palliative. Warm baths, galvanism, and massage have been recommended. Irvine's patient felt most comfortable after the use of the faradic current and an emollient ointment.

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ATROPHY OF THE FATTY LAYER OF THE SKIN.

Gilchrist and Ketron have recently reported in detail their findings in an extraordinary case of circumscribed atrophy of the fatty layer of the skin in a girl of 8, with a negative family history. Clinically, the affection was characterized by the appearance of pea-sized or larger, irregular or rounded, bluish-tinted, slightly depressed macules, which were not sharply defined but faded gradually into the surrounding tissue. From these were formed larger, sunken, morphea-like patches which were round, irregular or band-like, and reached a size of 10 cm. or more. Only the lower extremities were involved. Histologically the changes were confined almost entirely to the subcutaneous fat, and consisted of

infiltration with large phagocytic cells (macrophages) resembling xanthoma cells, with subsequent absorption changes. There was no excess of cholesterin in the blood. Sundwall has reported an interesting case in a girl of 19, in which only Scarpa's triangle and an area over the anterior surface of the tibia were involved.

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AINHUM.

Definition.—A disease of the hands and feet, characterized by linear strangulation and ultimate spontaneous amputation of one or more toes or fingers.

Symptoms.—According to Weinstein, the malady was first described by Messum, in 1821, although we are indebted to J. F. da Lima Silva and to Wucherer, of Bahia, for the earliest complete account of the affection. Examples of the disorder are occasionally observed in the United States, but the disease is essentially a tropical one, and in the vast majority of instances its victims are negroes. Ainhum commonly affects the smaller digits, particularly the little toe. Its onset is characterized by the development of a narrow groove or furrow on the flexor aspect of the affected toe, generally at a point underlying the first interphalangeal articulation. The groove gradually deepens and extends laterally until it forms an indurated, cartilage-like ring which completely encircles the digit. As a result of the constriction and the ensuing venous congestion, the distal extremity of the member gradually becomes swollen and thickened, and in the course of from 3 to 10 years spontaneous amputation takes place. Ulceration occasionally develops at the site of the encircling band, and there is usually more or less accompanying pain. While the separation commonly occurs at the first or second phalangeal joint, it may take place in the continuity of the phalanx. The fingers as well as the toes are sometimes attacked.

Etiology.—The exciting cause of the malady is not known. Various authors have ascribed its causation to trauma, bacterial infection and leprosy. In the case reported by Dühring both the father and mother of the patient were similarly affected. Stelwagon has recorded an example of the disorder in which both the toes and fingers were involved, and there was also present a generalized condition of the skin suggestive of pityriasis rubra pilaris. Hyde and Montgomery de-

scribe cases in which there was associated palmar and plantar keratosis. In a little patient referred to me by Dr. J. T. Gray, of Stillwater, Okla., the lesions were clinically indistinguishable from those of ainhum. The child ultimately succumbed to a nervous disorder of an obscure nature, and at the autopsy Dr. Frank J. Hall found degenerated areas in the cord, and sclerosis and neuritis of the peripheral nerves.

The various theories regarding the etiology of the condition have been summarized by Wellman as follows:

Fig. 370.—Ainhum. (Courtesy of Dr. Henry Weinstein, and The Southern Medical Journal.)

Fig. 371.—Ainhum. (Courtesy of Dr. Henry Weinstein, and The Southern Medical Journal.)

1. Due to injury, and the presence of foreign bodies (Manson, Eyles).
2. Self-mutilation.
3. Congenital spontaneous amputation (Proust).
4. Leprosy (Zambaco Pasha).
5. A variety of trophoneurosis (Wucherer, Schuebe, Darling).
6. A form of localized scleroderma (da Silva Lima).

Wellman considers that the chigger (Sarcopsylla penetrans) may be a causative factor in some instances. A consideration of the evidence now available indicates that the disease is a trophoneurosis.

Pathology.—There is present a marked hyperkeratosis, and a con-

siderable degree of acanthosis. The papillae are elongated and narrowed, and densely infiltrated with small round cells. Many of the vessels exhibit evidence of obliterative endarteritis. Wile, who examined Duhring's case, found the coil glands atrophied, but Eyles found hypertrophy of the glandular epithelium, with thickening of the membrana propria. In the cases reported by Weinstein, Darling found the constricting ring to consist of thick laminae of keratosquamous epithelium. The stratum malpighii was relatively narrow and the underlying corium was bereft of papillae and decreased in depth, in fact the corium and the periosteum of the bone so rapidly merged into one another that they could hardly be differentiated. As the normal skin was approached, the rete increased in thickness,

Fig. 372.—Ainhum-like disorder of the toes in a young child.

and its cells became larger and vesicular. The papillae also became more evident, although they were still nodose and not long and filiform as is usual in this location. At the margin of the horny ring, the corium was greatly altered by ulceration, and infiltrated by polynuclear leucocytes, red cells, and fibroblasts. Many newly formed arterioles and capillaries also were seen. In the tissue distal to the ring, the epithelium and corium presented the usual deep filiform appearance commonly seen in the skin of this region, and the blood vessels, sweat glands, nerve bundles, and the Pacinian corpuscles appeared normal.

Treatment.—Lima and others have suggested transverse incisions

of the constricting band in the earlier stages of the disease, and this measure proved helpful in the case under my care. In the majority of instances, however, amputation is indicated. Following excision, the pain disappears, and the stump generally heals promptly and without incident.

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PERFORATING ULCER.

Synonym.—Malum perforans.

Definition.—A chronic disorder of the extremities, characterized by the development of a deep sinus at some pressure point on the flexor surface of the feet or hands.

Fig. 373.—Perforating ulcer of the finger in a diabetic.

Fig. 374.—Perforating ulcer of the foot in a tabetic.

Symptoms.—The affection is a not infrequent complication of syphilis (tabes and general paralysis), leprosy, and diabetes. The earliest appreciable lesion is generally a callous or corn-like mass near the base of the first phalanx of the great toe, or on the heel. In the course of a few days or weeks suppuration takes place and the central portion of the keratosis sloughs off, leaving a superficial, circumscribed ulcer, surrounded by a thick, horny collar. At this

time the lesion resembles a suppurating corn, although the exquisite tenderness and pain usually found in a growth of that nature are wanting. Hyperesthesia may be present, but in the majority of instances both the ulcer and the tissues immediately surrounding it are more or less anesthetic. Sinus formation may proceed slowly or rapidly, and ultimately a tortuous channel leading far into the interior of the part results. The lesions are usually single, but may be multiple. In Rosen's case, the patient being a syphilitic, two ulcers developed on the same foot. The course of the malady is slow, but progressive, and even though improvement occurs it is commonly only temporary in character.

Etiology and Pathology.—The majority of the patients are males, between the third and fifth decades of life. The disease may result from injury to a nerve center, a nerve trunk, or a group of nerve terminals. It is probable that the first and last often act in combination. Savory and Butlin found degeneration of the fibrillae of the affected nerves, possibly due to pressure from the thickened endoneurium.

Diagnosis.—The lesions are to be differentiated from suppurating corns, and from simple tuberculous or syphilitic ulcers.

Prognosis and Treatment.—The condition can be ameliorated by absolute rest of the part, but the lesions generally recur promptly when the patient begins to use the limb again. Aside from the treatment of the parent disorder, if recognizable, the management of the malady is surgical.

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SYRINGOMYELIA.

Synonym.—Morvan's disease.

Definition.—A disease of the spinal cord characterized by sensory and trophic changes in the peripheral tissues, particularly those of the upper extremities.

Symptoms.—The onset of the malady is generally insidious, and the first symptoms noted by the patient are pain, and loss of muscular power in one or both arms. Occasionally, paresthesia, analgesia, or the development of one or more whitlows, may be the earliest appreciable manifestation of the presence of the disorder. In addition to the cutaneous and muscular atrophy which ultimately results, hyperidrosis, re-

flex disturbances, sensory changes, contractures and necrosis are not uncommon. The legs are occasionally attacked, as well as the arms. In a case recently referred to me by my friend Dr. Frank Dickson, large bullae frequently developed on the backs of both hands.

Etiology and Pathology.—The exciting cause of syringomyelia is not known. Zambaco Pasha believes it to be an attenuated or aberrant type of leprosy, but this opinion is shared by but few others.

Pathologically, the principal changes are found in the cord, and

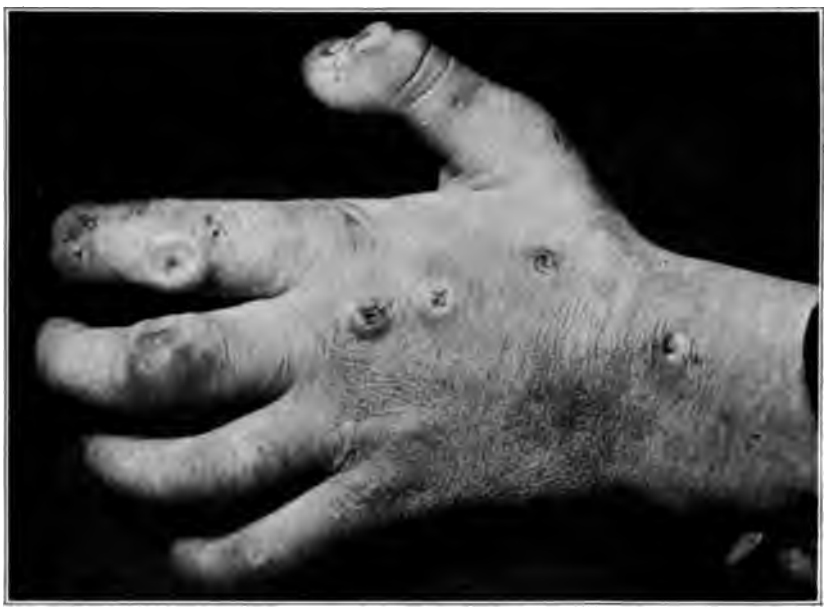

Fig. 375.—Syringomyelia, showing characteristic bullous and ulcerative lesions on hand.

consist of cavities in the posterior horns. The peripheral nerves are sclerosed, and the seat of chronic inflammatory changes.

Diagnosis.—The character of the lesions, and the presence of concomitant nervous symptoms should prevent confusion. In some instances, as Dyer has shown, the malady may bear a striking clinical resemblance to anesthetic leprosy, but in doubtful cases the presence of Hansen's bacillus should serve to distinguish the latter affection.

Prognosis and Treatment.—The disease is incurable, and the treatment simply palliative. Tonics and galvanism may be employed.

The cutaneous lesions are to be treated symptomatically, care being taken to guard the affected parts from sudden extremes of temperature and from trauma.

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CLASS VI.—ANOMALIES OF PIGMENTATION.

LENTIGO.

Synonyms.—Freckles; Ephelis.

Definition.—Lentigines, or freckles, are minute, circumscribed, brownish, pigmentary macules which occur chiefly on the face and the dorsal surface of the hands.

Symptoms.—This familiar disorder begins usually in early adolescence, and the pigmentation is generally more marked during the spring and summer months. It is an early and prominent symptomatic feature in xeroderma pigmentosum, and is occasionally observed following eczema and similar disorders in the aged. The lesions, which are due to small collections of pigment in the basal layer of the rete, are generally scattered irregularly over the nose, cheeks, and dorsal surface of the hands, but in rare instances the trunk and limbs also may be involved. Lenticular pigmentation of a localized or unilateral character has been noted in a few instances (Crocker). Individuals whose skins are normally very light in color are particularly susceptible to the malady. The lesions may develop suddenly or insidiously, and may be transient or permanent in character. Usually they are much less conspicuous during the winter months, many of the macules disappearing altogether. With the onset of the sunny season, however, a new crop develops, sometimes very suddenly, and persists until the return of the darker days of winter. They give rise to no subjective symptoms, and, aside from the disfigurement caused by their presence, are harmless.

Lentigo senilis is a type of the disorder which develops in elderly persons, or in younger individuals whose skins exhibit other evidences of senile change. In this variety the pigmented spots, which are indistinguishable from those of the ordinary type, exhibit a predilection for the neck and forearms, and are more or less persistent in character. Hutchinson has described six cases of this variety in which the eruption was confined to the orbital region, and in which many of the lesions ultimately became the site of carcinomata.

Etiology and Pathology.—Unna separates pigmentations of the

skin into two general classes; hemasiderotic (iron-containing pigment), and melanotic (iron-free pigment). Freckles belong in the latter group. The disorder is due to deposits of pigment in the lowermost layers of the rete. The exciting cause in the majority of cases is sunlight. The universal types are probably symptomatic in many instances (a result of anemia, chronic abdominal disorders, etc.).

Treatment.—Aside from prophylaxis, which consists in guarding the commonly affected areas from the direct rays of the sun, the treatment is essentially that of chloasma and other superficial pigmentations of the skin. The most efficient remedy for the temporary removal of the eruption is a mixture of mercuric chloride (1 part),

Fig. 376.—Lentigines on forearm.

alcohol (25 parts), and water (74 parts). The affected areas are rendered free from oil by the use, once or twice daily, of benzine, and the mercury lotion dabbed on, by means of a small swab, three or four times during the twenty-four hours. An almost imperceptible exfoliative dermatitis is set up, and the lesions are soon "peeled" off. Care should be taken to avoid an acute dermatitis, which generally aggravates the pigmentary process. Symptoms of excessive irritation generally subside promptly following the application of calamine lotion, alone, or alternated with cold cream. Ointment preparations containing mercuric chloride (1 to 2 per cent), ammoniated mercury (10 to 20 per cent), or bismuth subnitrate (10 per cent), alone or in combination, also are effective. Hardaway recommends the negative galvanic needle.

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CHLOASMA.

Synonyms.—Liver spots; Moth patches; Melanoderma.

Definition.—A pigmentary disorder characterized by diffuse discoloration of the skin, or by the occurrence of variously sized and shaped, yellowish or brownish, macular lesions.

Symptoms.—In the localized type the pigmented areas are commonly rounded or oval in outline, with ill-defined margins. Not infrequently they coalesce, forming large irregular patches. The only appreciable change in the skin is in its color. In the circumscribed va-

Fig. 377.—Chloasma in a young girl. Lesions are symmetric, an unusual feature, but involve usual regions.

riety the face, particularly the forehead and the malar prominences, are the sites of predilection, although any part of the surface, and even the mucous membranes, may be involved. The patches vary from a light yellow to black in color, and give rise to no subjective symptoms.

In the diffuse variety the pigmentation may be very extensive, and even universal. In the areas which are normally dark, as the nipples, axillae and genitalia, the coloration is more exaggerated than on other parts of the body. The lesions of chloasma may be idiopathic or symptomatic in character.

In the idiopathic form, which occurs as a result of the action of some external factor, such as heat (as in pigmentation following erythema ab igne), pressure and friction (from truss pads and similar appliances), trauma (severe scratching, as in pediculosis and in various pruritic disorders), actinic light rays (from the sun, from powerful arc lamps), x-rays, and chemical irritants (particularly mustard, croton oil, and cantharides), the pigmentation usually develops only at the site of irritation, but it may extend far beyond it, as in Dubreuilh's case. In symptomatic chloasma, the lesions develop during the course of certain constitutional disorders or as the result of some general intoxication. Of the various subtypes, *chloasma uterinum,* which is associated with functional or organic disturbance of the utero-ovarian system, is probably the most common. The lesions usually appear on the forehead and other parts of the face, and occasionally on the nipples and other parts of the body. Of the organic and systemic affections, the condition is a characteristic accompaniment of Addison's disease, and its presence is also occasionally noted in tuberculosis, chronic malaria, secondary syphilis, hypertrophic cirrhosis of the liver, rheumatoid arthritis, Graves' disease, and cancer.

Etiology.—As Pusey states, the ordinary form of chloasma is frequently unassociated with any demonstrable pathological condition. The majority of the patients are adult females. The symptomatic discoloration occurring in urticaria pigmentosa, acanthosis nigricans, lichen planus, and similar disorders need only be mentioned. An animal parasite, the demodex folliculorum, has been credited with the causation of the lesions in a few instances.

Pathology.—The coloring matter, a melanotic pigment, is found scattered through the lower layers of the rete. Otherwise the lesions differ from freckles only in size.

Diagnosis.—Chloasma may be confused with the hyperpigmented areas surrounding vitiligo patches, with chromidrosis, and with various fungous diseases of the skin which give rise to brownish discoloration. The shape, size and color of the lesions, however, together with the fact that they contain no fungi and cannot be washed off with ether, should serve to distinguish them.

Prognosis.—The favorableness of the outlook is largely dependent upon the nature of the cause. The utero-ovarian cases are usually the most persistent, and are exceedingly obstinate and resistant to treatment. In chloasma occurring as a sequela or concomitant to

other cutaneous disorders, the lesions are rarely permanent in character.

Treatment.—As in all disorders of obscure origin, the patient should first receive a careful and thorough general examination, in order to discover if possible the exciting cause of the eruption. The nature of the constitutional remedies to be advised is wholly dependent upon the result of such an investigation. The pigmented patches can be temporarily removed by the use of various scaling solutions and peeling pastes. The most satisfactory of these is a mixture of mercuric chloride (1 part), alcohol (25 parts), and water (74 parts), to be painted on several times daily, until a mild degree of desquamation results. A saturated alcoholic solution of salicylic acid also is good, and lactic acid, phenol, resorcin paste (10 per cent), and hydrogen peroxide have been recommended.

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CHLOASMA.—*Dubreuilh*, Ann. de dermat. et de syph., 1891, ii, p. 76. — *Hartzell*, Jour. Cutan. Dis., 1912, p. 462 (pigmentation following application of heat, erythema ab igne). — *Unna*, Monatsh. f. prakt. Dermat., 1889, viii, p. 366; Ibid., Histopathology.

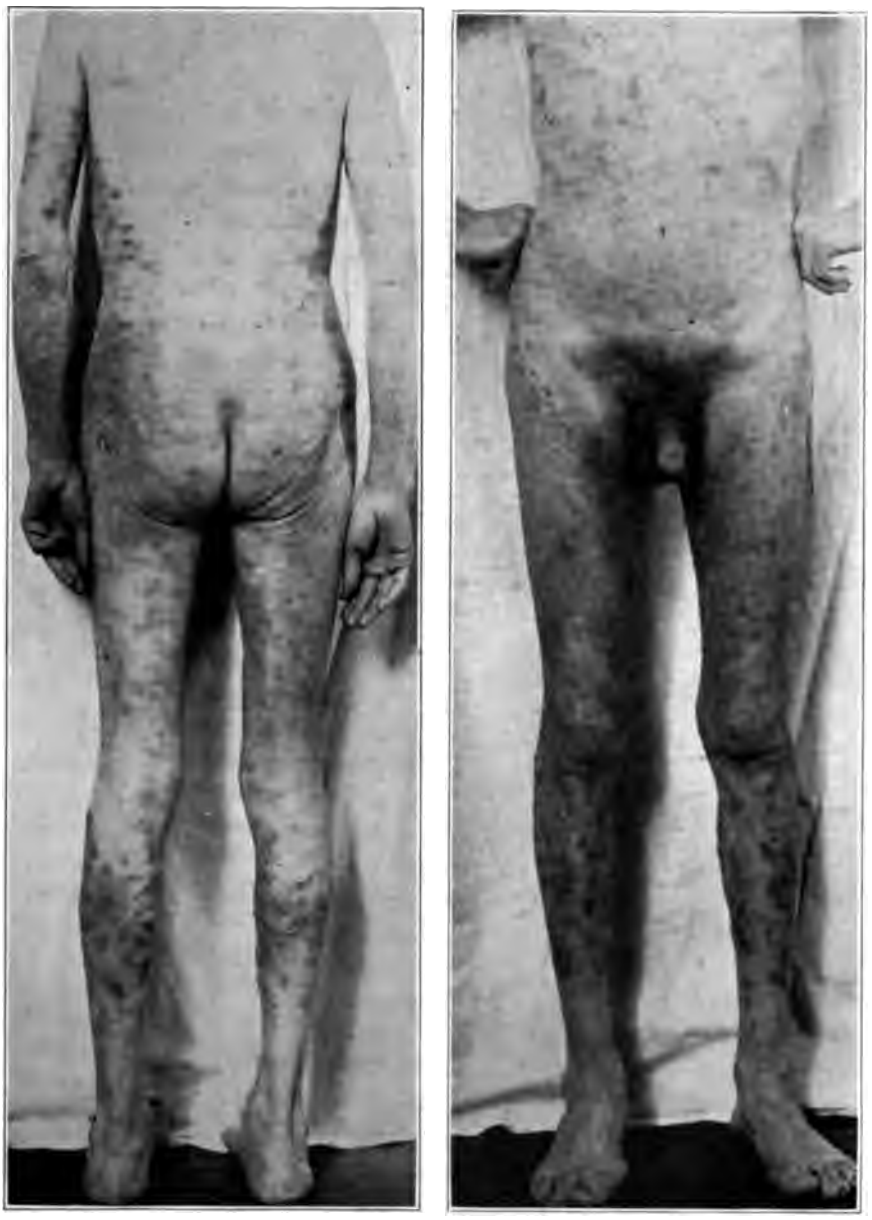
TATTOO MARKS AND POWDER STAINS.

Tattooing consists in the introduction into the derma of various insoluble substances (such as carmine, indigo, vermilion, cinnabar, or similar coloring agents) for purposes of personal adornment. Pusey has recently reported an interesting case in which the use of wet dressings of a solution of copperas resulted in a follicular purpura-like pigmentation of the neck, shoulders, wrists and elbows of a young woman. The coloring matter becomes encapsulated, and is both indelible and permanent. The particles are firmly imbedded in corium and subcutaneous tissue, and their removal is usually a matter of difficulty. In extensive cases Dubreuilh's method, which consists in shaving off the superficial layers of the skin, and covering the part with grafts, is the most practicable. Ohmann-Dumesnil has suggested the introduction of glycerol of papoid or of caroid into the tissues by means of a bundle of fine needles, and Brault recommends the use of a 40 per cent aqueous solution of zinc chloride, tattooed in by similar means. Variot employs a concentrated solution of tannin in place of papoid or zinc chloride, and afterwards rubs the part vigorously with a silver nitrate stick.

All of these methods are dependent upon a destructive inflammatory process, and none is particularly reliable or cleanly. Deep freezing with carbon dioxide snow occasionally results in sufficient destruc-

tion of tissue to substitute a soft, white scar for the pigmented areas, but the procedure gives rise to considerable pain and discomfort, and sometimes terminates in failure. If the lesions are minute, as in

Fig. 378.—Tattoo marks. Probably the most extensive case of tattooing in the world. (Courtesy of Professor Gus Wagner.)



A. *B.*

Fig. 379.—Pigmentation of the skin following use of needle in a morphine habitue. (Courtesy of Dr. Otto Leslie Castle.)

powder stains of slight extent, a Watson-Keyes cutaneous punch, or the negative galvanic needle can frequently be employed with very satisfactory results. In the treatment of powder stains it is essential that the particles be removed at the earliest possible moment if the

Fig. 380.—Ulceration and pigmentation following use of hypodermic needle. (Courtesy of Dr. Anstruther Davidson.)

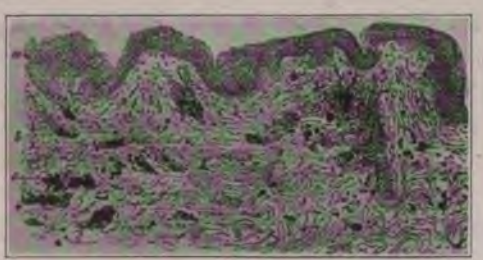


Fig. 381.—Deposit of cinnabar in tattooed skin. (Zeigler.)

best results are to be secured. I have found in the early cases that the preliminary use of a peeling paste, such as resorcin (4 parts), salicylic acid (4 parts), rose water ointment (22 parts), greatly facilitates the removal of the particles of foreign matter. C. J. White recommends scrubbing the skin roughly with a scrubbing brush dipped in some antiseptic solution. The sensitiveness of the part can be lessened by the application of novocain, in ointment or solution. If necessary the anesthetic can be forced into the openings by means of the galvanic current (the solution being applied on the positive electrode), and the offending material removed with a narrow-bladed, sharp-pointed knife. If the particles are very superficial they can be loosened and floated out by the use of hydrogen peroxide. The value of this preparation as a "bleaching agent" in a condition of this kind is exceedingly questionable, however.

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TATTOO MARKS AND POWDER STAINS.—*Dubreuilh*, Ann. de dermat. et de syph., 1909, iv, S, x, p. 367; Ibid., Gaz. hebd. Sc. med. de Bordeaux, 1909, xxx, p. 81. — *Ohmann-Dumesnil*, St. Louis Med. and Surg. Jour., 1900, lxxxviii, p. 65. — *Brault*, Ann. de dermat. et de syph., 1895, iii, S, vi, p. 83; Ibid., 1901, iv, S, p. 682. — *Variot*, Compt. Rend. Soc. de Biol., 1888, p. 636. — *Watson*, Med. Record, New York, 1878, xiv, p. 78 (discotome). — *Keyes*, Jour. Cutan. Dis., 1887, p. 99. — *Pusey*, Jour. A. M. A., 1917, lxviii, p. 627.— *Dohi*, Arch. f. Dermat. u. Syph., 1909, xcvi, p. 3 (Histopathology of tattoo marks). — *Pusey*, Ref. Hand. Med. Sc., 1917, viii, p. 102. — *Keidel and Zimmermann*, Am. Jour. Syph., 1918, ii, p. 83 (excellent paper on tattooing and syphilis. Bibliography).

ALBINISMUS.

Synonyms.—Congenital leukoderma; Congenital achromia; Congenital leukasmus.

Definition.—A congenital absence of pigment in the skin, hair and eyes.

Symptoms.—Albinism may be partial or universal. In the former variety the lesions simulate those of leukoderma, although hyperpigmented areolae are never present, and the distribution is rarely, if ever, symmetrical. In rare instances the lesions may exhibit a preference for certain nerve areas (as in a case described by Hutchinson). Portions of the scalp occasionally are involved, the resulting condition sometimes being referred to as "poliosis eccentrica." While possibly somewhat more frequent in the colored than in the white race, the presence of the snowy lesions on the skin of the negro is so noticeable and conspicuous that it invariably attracts attention.

In the universal form, the absence of coloring matter is complete. The pupil of the eye appears red, and the iris pink, or blue (from reflected light), and there is more or less photophobia and nystagmus. The hair is white, or very pale yellow, in color, and silky in texture.

The skin is whitish or pinkish in color, and does not tan on exposure to sunlight. The majority of albinos are both mentally and physically below par, exceptions only occasionally being noted. Heredity, or at least a marked family tendency to the condition has frequently been noted. Although apparently endemic in certain tropical countries (such as Lower Guinea), its comparatively frequent occurrence in these regions is possibly a result of consanguinity.

Pathology.—With the exception of the absence of pigment, the skin is normal in every respect.

Prognosis and Treatment.—The condition is as a rule permanent, and treatment is of no avail.

REFERENCES.

ALBINISMUS.—*Crocker*, Diseases of the Skin, Phila., 1908, i, p. 673. — *Knowles*, Interstate Med. Jour., 1916, xxiii, p. 555 (family albinism). — *J. E. Lane*, Med. Record, New York, 1916, xc, p. 986 (albinism and vitiligo).

VITILIGO.

Synonym.—Acquired achromia.

Definition.—An acquired affection characterized by the development of milky-white patches of various sizes and shapes.

Fig. 382.—Vitiligo. (Courtesy of Dr. John W. Perkins.)

Symptoms.—The lesions are generally round or oval in outline, with hyperpigmented areolae, and as a rule exhibit a tendency to peripheral extension. Their distribution is more or less symmetri-

cal, the extensor surfaces of the hands, the face, and the trunk being the sites of predilection. No region is exempt, however, and Hardaway, Stelwagon and others have reported cases in which the involvement was almost universal. The activity of the skin glands in the affected areas is not influenced, but the included hair shafts commonly lose their pigment, and become whitish or yellowish in color. It is very probable, as Crocker states, that the disease is more frequent in tropical countries.

Fig. 383.—Vitiligo, an unusually extensive case. (Courtesy of Dr. J. W. Perkins.)

Fig. 384.—Vitiligo in a full-blooded Indian. (Courtesy of Dr. Everett S. Lain.)

The lesions give rise to no subjective symptoms, and the patient's general health is not affected.

Etiology and Pathology.—The cause of vitiligo is not known. The majority of investigators hold that it is very probably a trophoneurosis. Heredity is apparently a factor in some instances. It is not infrequently associated with alopecia areata, and with the circumscribed type of scleroderma, and Dore and others have noted its occurrence in Graves' disease. Crocker believes there is an increased deposition of pigment preceding the white patches, an opinion which is shared by Stelwagon. Histologically, the only changes that have

been proved to exist are the absence of coloring matter in the white patches, and the presence of excessive amounts of pigment at their margins. I have encountered two cases of vitiligo in which each of the patches, which were rounded or oval in outline, presented a small, brownish, maculopapule in the center. A circumscribed mass of endothelial

Fig. 385.—An extensive case of vitiligo, with beginning re-pigmentation on forearms. (Courtesy of Dr. J. B. Shelmire.)

cells was found in the underlying derma. Shelmire, of Dallas, has recently reported a third case of this type. The lesions described by Bunch undoubtedly belong in the same category.

Diagnosis.—The disease is to be differentiated from partial albinismus, morphea and anesthetic leprosy.

In partial albinismus the lesions are congenital and asymmetrically distributed, and there is no surrounding zone of hyperpigmentation. In morphea (circumscribed scleroderma) the hard, indurated char-

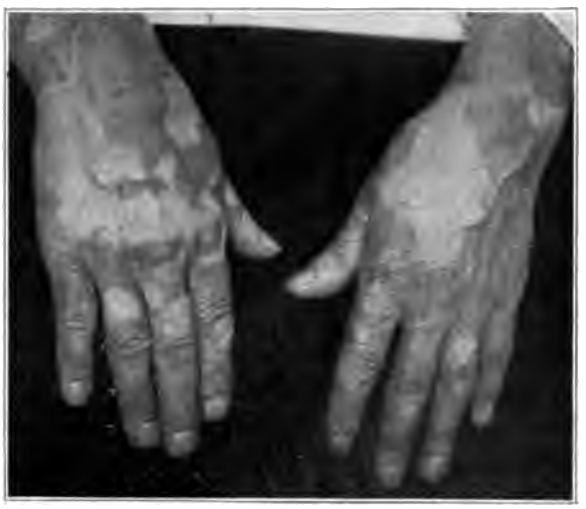

Fig. 386.—Vitiligo, a common location for the lesions.

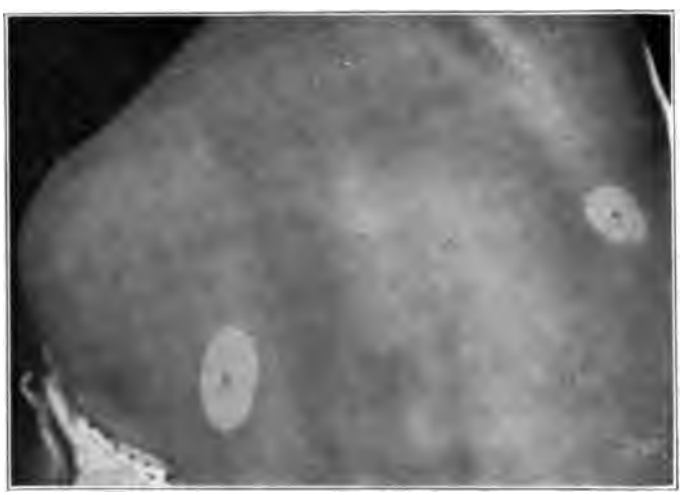

Fig. 387.—Vitiligo of unusual type. The lesion commenced as a minute brown spot, which persisted in the center of the patch.

acter of the patches, and the presence of telangiectases are distinctive.

The occurrence of sensory changes, and of other characteristic mani-

festations in leprosy should serve to prevent confusion with that disease. The hyperpigmentation at the borders is suggestive of both chloasma and pityriasis versicolor, and in cases presenting a considerable degree of pigmentation it is sometimes necessary to exclude these two disorders.

Prognosis.—The disease is usually slowly progressive in its course and only in exceptional instances do the patches disappear.

Treatment.—Internal treatment is of little or no value, although

Fig. 388.—Peliosis circumscripta acquisita occurring in a case of vitiligo.

many drugs, particularly arsenic, potassium iodide, pilocarpine, and extracts of thyroid and suprarenal glands, have been recommended. The lesions may be rendered less noticeable by the application of dilute solutions of walnut juice or a similar preparation. I have found partial removal of the pigment at the margins of the patches the most satisfactory plan. This can easily be done by the repeated use of a strong solution of mercuric chloride (mercuric chloride 1 part, alcohol 25 parts, and water 74 parts, painted on several times daily, until desquamation ensues), and renders the affected areas far less

conspicuous. Stein, and King and Parker have found the Kromayer lamp helpful in some instances, and I have employed it with success in one case.

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VITILIGO.—*Hardaway*, Manual of Diseases of the Skin, 4th ed., p. 280. — *Stelwagon*, Am. Jour. Med. Sc., 1885, xv, p. 168; Ibid., Trans. College of Physicians, Phila., 1894, 3rd S, xvi, p. 100. — *Dore*, Brit. Jour. Dermat., 1900, p. 353. — *Stein*, Arch. f. Dermat. u. Syph., xcvii, p. 163. — *Sutton*, Jour. Cutan. Dis., Feb., 1917. — *Shelmire*, Jour. Cutan. Dis., April, 1917. — *Bunch*, Prac. Roy. Soc. Med., 1918, xi, p. 18. — *John E. Lane*, Trans. Dermat. Sec., A. M. A., 1919. (Vitiligo and syphilis. An interesting paper, with numerous French references, and valuable discussion.)

Argyria.—Argyria is the term applied to the permanent discoloration of the skin which sometimes follows the prolonged administration of silver salts, particularly the nitrate. Formerly the condition was a not uncommon one, owing to the frequent employment of this drug in the treatment of epilepsy and of various gastric disorders, but at present, it is fortunately rare. Anstruther Davidson has reported an interesting case of generalized argyria which developed following the long-continued use of argyrol injections. The earliest signs of pigmentation are noted on the edges of the gums. The hue of the affected skin varies from a bluish or bluish-gray to a slate or bronze color. The mucous membranes, and even the internal organs, also may be involved. According to Unna, the deposit of dark silver combinations in the skin takes place either universally and indirectly from the blood, "generalized argyria," or directly from without, "localized argyria" (such as occurs in silver workers, and following repeated local applications of the drug to the urethral and conjunctival mucous membrane). In generalized argyria, the face and hands are the sites of predilection, although no part of the body is wholly spared. The deposit of silver, or rather silver combination, is limited to the margin of the connective tissue, and affects particularly the elastic fibers and the sheaths of the membranes. Frohmann found silver granules in both the membrana propria and the ducts of the coil-glands, and in the case examined by Neumann the sebaceous glands and hair follicles, the walls of the veins, and the neurilemma all contained silver, and many of the elastic fibers were completely sheathed with the metal. The condition is irremediable.

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ARGYRIA.—*Unna*, Histopathology. — *Frohmann*, Virchow's Arch., 1859, xvii, p. 135. — *Neumann*, Wien. med. Jahrbuch, 1887, p. 369. — *Blaschko*, Monatsh. f. prakt. Dermat., 1886, p. 197; Ibid., Arch. f. mik. Anat., v, xxvii, p. 651. — *Davidson*, Jour. Cutan. Dis., 1916, p. 605.

CLASS VII.—NEUROSES.

HYPERESTHESIA.

Hyperesthesia of the skin is a functional disorder characterized solely by exaggerated sensitiveness of the affected part. The condition may be idiopathic, but in the majority of instances it is symptomatic. The distribution may be universal, but is generally localized, and in certain nerve areas may be unilateral or bilateral. It occurs most frequently in individuals who are the subjects of hysteria and other functional disorders of the nervous system, but is occasionally observed in urticaria and similar maladies. Cutaneous sensation as a whole may be affected, or only certain filaments, such as those of contact or of pain, may be involved. The condition may be transient or persistent in character, the duration being largely dependent upon the underlying cause.

MERALGIA PARESTHETICA.

J. C. White and, more recently, Sherwell have called attention to a peculiar disorder which appears to affect only the external femoral cutaneous nerve (the outer side of the lower two-thirds of the thigh), and is characterized clinically by hyperesthesia or anesthesia, and sensations of pain, numbness, formication, etc. The symptoms are most marked when the patient is in an upright position. The exciting cause is unknown, and treatment is commonly without result. It is possible that a defective arch, with resultant changes either in the foot, or in the comparative position of the long bones, bears some causative relationship to the condition. Goldenburg has reported relief in one instance following the use of a metal arch support on the affected side.

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Meralgia Paresthetica.—*J. C. White*, Jour. Cutan. Dis., 1906, p. 160. — *Goldenburg*, Jour. Cutan. Dis,, 1906, p. 163.

DERMATALGIA.

Synonyms.—Rheumatism of the skin; Neuralgia of the skin.

Definition.—Painful sensations of the skin, not consequent upon any appreciable structural lesion.

Symptoms.—The disorder may be primary, but is usually secondary and dependent upon some organic disturbance of the nerve centers, especially the cord. Localized areas, particularly on the hairy parts, are the sites of predilection, although in rare instances the pain is generalized in distribution. The sensations may be burning, pricking or stinging in character, and are generally worse at night (Duhring). The etiology of the disorder has been variously ascribed to rheumatism, chlorosis, hysteria, exposure to cold, neuritis, and similar depressing influences. It is a not infrequent accompaniment of tabes, and is occasionally observed in diabetes mellitus.

Causalgia (S. Weir Mitchell) is a form of dermatalgia characterized by burning pain in the affected part, and is a frequent subjective symptom of glossy skin (q.v.).

Treatment.—Both prognosis and treatment are largely dependent upon the nature of the underlying disorder. In the idiopathic cases the pain often disappears spontaneously, as mysteriously as it came. Counter-irritation over the ganglion of the offending nerve, galvanism, and anodyne drugs, such as aspirin, phenacetin and salicin, may be tried.

ERYTHROMELALGIA.

Synonym.—Red neuralgia.

Definition.—A disorder of the extremities characterized by shooting, throbbing, or burning, neuralgic pains, with accompanying congestion and patchy redness of the affected parts.

Symptoms.—The affection was described independently by S. Weir Mitchell and by Graves, in 1872. The majority of the reported instances have occurred in males. The affection may be unilateral or bilateral, and one or both hands and feet or all four extremities may be attacked. There may be associated atrophic changes in the involved parts. One or more fingers or toes are generally first involved, an attack being characterized by swelling and redness of the affected extremity. There is intense pain in the part, usually of a burning, neuralgic character, and some local elevation of temperature. The duration of the exacerbations is variable. Sometimes they last for hours, again for only a few minutes. Occasionally the attacks are apparently precipitated by slight pressure or friction, and almost invariably the severity of the pain is aggravated by warmth and by gravity. In a case referred to me by my friend, Dr. Julius Bruehl, of Kansas City, the disorder involved the palms, and the patient would sometimes keep his hands elevated for a half hour or

longer at a time in order to alleviate his suffering. In this instance, the patient stated that even the pressure exerted in turning the knob of a door would bring on an attack which might persist for ten or twelve hours. No trophic disturbances were noted, but the entire flexor surface of the hands became purplish or mottled in color during an exacerbation and so much swollen as to resemble a cushion.

Etiology.—Mitchell and Spiller believe that the condition may be a result of either a peripheral neuritis, or of changes occurring in the nerve trunk at some point between the cord and the peripheral ramifications. It is probable that either organic disease of the cord (Collier), or a peripheral neuritis (such as was present in the case studied by me) may be at the bottom of the trouble. In the ten cases reported by Collier, there were evidences of multiple sclerosis in six, tabes in two, traumatic necrosis in one, and myelitis in one.

Prognosis and Treatment.—The favorableness of the outlook is entirely dependent upon the nature of the underlying causative factor. In those cases which present no discoverable manifestation of cord involvement the prognosis is fairly good. Of the various internal remedies, aspirin, salicin, and phenacetin are probably the best and safest analgesics. Any associated organic affection of the nerves should receive appropriate treatment. Galvanism (with the positive electrode placed over the root of the affected nerve, and the negative sponge gently stroked backward from the periphery) sometimes proves helpful. Cooling applications, such as menthol, in alcoholic solutions or in ointments, may alleviate the pain temporarily. The x-rays proved beneficial in the case here described. In the more aggravated types resort must be had to nerve stretching, intraneural injections of alcohol, or preferably, of quinine and urea hydrochloride. Amputation may have to be resorted to in extreme instances.

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ERYTHROMELALGIA.—*Mitchell*, Phila. Med. Times, 1872-3, iii, pp. 81 and 113; Am. Jour. Med. Sc., 1878, lxxvi, p. 17. — *Mitchell and Spiller*, American Jour. Med. Sc., 1899, cxvii, p. 1. — *Graves*, Clinical Lectures, Dublin, 1864, p. 826. — *Collier*, Lancet, London, 1898, ii, p. 401. — *Vorhees*, Jour. A. M. A., 1907, xlviii, p. 1837.

PRURITUS.

Definition.—Pruritus is a functional disorder of the skin characterized by the presence of itching and similar sensations, unaccompanied by appreciable structural changes.

Although such expressions as itching, burning, prickling, and tingling are commonly employed in describing the subjective symptom-

atology of many inflammatory cutaneous affections, the term "pruritus" as here used refers solely to a disease in which these subjective symptoms are the only appreciable symptoms. Whether these sensations are a result of the disturbed sense of contact, as Bronson asserts, or not, remains to be proved.

Symptoms.—The primary symptoms are those of itching, burning, tingling or formication; the secondary manifestations, such as hyperemia, laceration, infiltration, and lichenification, develop simply as a result of trauma from scratching and rubbing.

The subjective symptoms may be constant or intermittent in character, and the disorder may involve one or several regions, or even the entire surface. Exposure to heat or cold will generally excite an attack, and in a type which is known as "*bath pruritus,*" the burning and itching come on immediately after bathing. The desire to scratch is almost irresistible, and the objectively normal skin soon presents hyperemic, rough and even bleeding areas, as a result of the patient's efforts to secure relief by scratching. In the generalized cases *(pruritus universalis)* the entire surface is seldom or never attacked at one time, but the sensations develop first at one point and then at another, often skipping to distant regions on the body, usually without appreciable cause. The most common generalized variety is that occurring in persons of advanced age *(pruritus senilis),* and is probably a result of degenerative changes in the skin, with associated dryness and defective elimination. Another frequent type is that occurring in patients who are suffering from functional or organic hepatic derangement with associated jaundice. Mental disorders and depressing mental influences also may play a certain part in the causation, *acarophobia* being an example of this type.

In the localized forms the anal and genital regions are the parts most frequently affected. While the inception of the disorder can occasionally be traced to the presence of varicose veins, fissures and other local pathologic conditions, in the majority of instances it is impossible to locate an etiologic factor. *Pruritus vulvae* is not uncommon in pregnant women, and pressure and venous congestion are possibly supplementary causes. In vulvar pruritus the itching may be confined to the mons veneris, the labia, vagina or clitoris, singly or collectively, and may be so intense as to seriously menace the health of the affected individual. In *pruritus scroti,* the disorder is usually confined to the scrotum proper, although the shaft of the penis and the perineum are occasionally involved. As a result of the con-

stant rubbing and scratching, the scrotum may become entirely denuded of hair, and smooth and shiny. Or on the other hand a secondary eczematoid condition may develop with thickening, redness and oozing of the involved integument.

Pruritus ani is probably the most common of all types of the localized itching, and is an exceedingly distressing ailment. The anal, perianal or intraanal regions may be involved. Fissures or hemorrhoids are frequently, although not invariably, present also. As a re-

Fig. 389.—Pruritus hiemalis in a young girl. (Courtesy of Dr. Howard Morrow.)

sult of the continued scratching and irritation, thickening and induration, eczema, and even carcinoma, may develop secondarily.

Pruritus hiemalis and *pruritus æstivalis* are peculiar recurrent types of dermatitis which develop at the advent of winter and summer respectively, and persist throughout the season. Pruritus hiemalis is by far the more common and important of the two, as Duhring, Hutchinson, Corlett and others have shown. It commences in November or December and lasts until April or May. The attacks occur oftenest at night when the patient is disrobing or in the morning when he arises. The lower extremities are the parts most frequently involved, although the face, hands and other parts are fre-

quently attacked. The paroxysm of itching lasts for several minutes to an hour or more, but finally dies down as the normal surface temperature of the body is regained. Adults, particularly those whose skins are dry and harsh, are the most frequent victims of the disorder.

Etiology.—As Bronson has suggested, the most important predisposing factor in pruritus of any type is cutaneous hyperesthesia. More tangible causative factors are the presence of degenerative changes in the skin, such as occur in old age, and jaundice, glycosuria, intestinal derangements, oxaluria, gestation, utero-ovarian disorders, nervous and mental diseases, and, following the absorption of certain drugs (particularly opium and cocaine). In the localized types, a direct causative factor can occasionally be unearthed. Pin and round worms, constipation, hemorrhoids, and fissures are common causes of pruritus ani; and diabetic urine, utero-ovarian disturbances, gestation, and leucorrheal discharges are responsible for vulvar pruritus in many instances. It has been suggested that pruritus ani is of bacterial origin, and the administration of antistreptococcic serum and autogenous vaccines has been advised, but in my hands these agents have proved ineffective and disappointing. Syphilis is a contributory, and possibly a causative, factor in a small percentage of cases of pruritis in this region. Careful search should always be made for focal infections of the tonsils and teeth; and if discovered, they should promptly be eradicated.

Bath pruritus is due to both the water and the temperature change to which the skin is subjected (prolonged immersion in very hot or very cold water aggravates the condition). The majority of the patients have harsh, dry, irritable skins.

Pathology.—There are no appreciable structural changes in the affected nerves.

Diagnosis.—In uncomplicated cases the diagnosis (itching without objective symptoms) is easy. In those instances where secondary changes have occurred as a result of trauma, scabies, pediculosis and similar parasitic affections, as well as urticaria and eczema may be excluded. The history, the localization of the affected areas, and a careful search for animal parasites should serve to prevent error.

Prognosis.—In the generalized types of pruritus the prognosis should be guarded. In the localized forms relief can generally be secured. Bath pruritus and the seasonal types can be palliated, but complete freedom from distress is usually dependent upon a change of climate.

Treatment.—If possible, the exciting or contributory cause should be located and removed. The character of the constitutional remedy to be advised is largely dependent upon the nature of the associated condition. Generally speaking, the diet should be simple, nutritious and easily digestible, and the patient should drink plentiful amounts of fresh water. Buttermilk, if agreeable, is excellent in this condition, as in all cutaneous disorders. Alcohol, tea, coffee and tobacco are likely to prove harmful. The bowels and kidneys should act freely, and resort should be had to saline laxatives and alkaline cathartics (alone, or with small amounts of sodium bromide added), if necessary. In the generalized types, internal remedies often alleviate the discomfort. I have found pilocarpine, phenacetine and the bromides to be the most satisfactory of these. Quinine, belladonna, phenol, cannabis indica, strychnia, calcium chloride and lactate, arsenic, and sodium salicylate all have their advocates. In administering the bromides, it is best to start in with fairly large doses ʒss to ʒi (2.0 to 4.0) every four or six hours, until the physiologic effect is secured, when the amount may be reduced to gr. xv (1.0), after meals and at bed hour. In administering pilocarpine, care should be exercised to guard against depression of the heart, and also against sudden exposure to cold and to chilly drafts.

In vulvar and anal pruritus, the patient should be examined by a capable gynecologist or proctologist before cutaneous medication is resorted to. In all types of pruritus the external treatment is of great importance. The underclothing should be soft and non-irritating. Cotton, lisle, silk or linen is preferable to woolen material. During the colder months two suits may be worn at once, if necessary, thus retaining the necessary warmth, and at the same time avoiding the harmful effects exerted by woolen garments.

In the majority of instances individuals who suffer from pruritus possess harsh, dry skins. For this reason frequent bathing, particularly in soapy water, is to be avoided. In the milder generalized cases, in fact in all cases at the beginning, recourse may be had to carbolized calamine lotion, with or without 5 or 10 per cent of liquor carbonis detergens added:

℞ Phenolis ..... ♏ xv (1.0)
Zinci oxidi,
Amyli pulveris,
Calaminæ ..... āā ʒ v (20.0)
Glycerini ..... ʒ iiss (10.0)
Aquæ ..... q. s. ad fʒ vi (180.0)
Misce.

If, despite the glycerine content, the integument is still too dry, olive or sweet oil rubs may be employed, night and morning, or carbolized zinc oil (.5 to 1 per cent) may be employed. Another excellent application in the generalized cases is a calamine and carron oil mixture. In large areas care must be exercised to prevent the absorption of such toxic substances as carbolic acid.

In the generalized types which are accompanied by seborrhea a stimulating antipruritic may be employed:

℞ Mentholis	℥ iss	(6.0)
Thymolis	℥ ii	(8.0)
Chorali hydrati	℥ i	(4.0)
Chloroformi	℥ ii	(60.0)
Olei eucalypti	℥ ii	(8.0)
Olei gaultheriæ	℥ iv	(15.0)
Alcoholis q. s. ad	f℥ viii	(240.0)

Misce.

Bran, starch, and alkaline baths also are sometimes helpful in the oily generalized types, particularly if the skin is carefully dried afterward by tapping, and Anderson's powder applied:

℞ Camphoræ pulveris	℥ i	(4.0)
Zinci oxidi	℥ v	(20.0)
Amyli pulveris q. s. ad	℥ ii	(60.0)

Misce.

In the localized forms, applications containing much higher percentages of carbolic acid and similar antipruritics may be used. By far the best of these, in my experience, is Bronson's oil:

℞ Phenolis	℥ i	(4.0)
Liquoris potassii hydroxidi	℥ i	(4.0)
Olei lini q. s. ad	℥ i	(30.0)

Misce.

The patient should dress and undress in a warm room, and the bed should be warmed before entering it.

The first two ingredients may often be advantageously increased, even up to ℥ii (8.0) to the ounce. In pruritus ani ointments containing tar, ammoniated mercury, or even calomel, occasionally are of service. A 10 per cent camphor-chloral ointment is helpful in some instances. Frequent applications of folded cloths wrung out in very hot water often relieve for a time.

A 10 per cent aqueous solution of silver nitrate, painted on twice weekly, generally proves palliative and sometimes is even curative. In pruritus ani, Hamburger has found local applications of calomel help-

ful. By far the best and most reliable of all remedies in combating anal, scrotal and vulvar pruritus is the x-rays. The agent is applied in moderate dosage at daily or tri-weekly intervals. It is not necessary to produce an erythema, and I have never seen sexual debility or impotence follow its use. The plan was first suggested to me by Pusey, several years ago, and in a large number of cases in which I have tried it, the results have been far superior to those obtained by any other method. Radium exerts a similar effect in these cases, and is particularly valuable in the localized types (pruritus ani). Stone has recently suggested the use of subcutaneous injections of alcohol (95 per cent) in anal pruritus. A local anesthetic, usually novocain, 1 per cent, is employed. The syringe is filled with alcohol, and the usual hypodermic needle is carried vertically through the skin to the subcutaneous fat. The whole area is then infiltrated with alcohol, up almost to the margin of the anus. In bath pruritus, the frequent application of a bland oil is helpful at times. The use of soap (unless it be almost neutral, as D. and W. Gibb's superfatted soap) should be avoided as much as possible. The water should be only moderately warm, and I have found the addition of magnesium sulphate (℥ii—60.0) beneficial. After drying, the free use of Anderson's antipruritic powder greatly lessens the discomfort.

In pruritus hiemalis the liberal employment of a plain grease, such as cold cream, alone or with 1 to 5 per cent salicylic acid added, is soothing and comforting. If necessary, phenol, or menthol, or both, in strengths of 1 to 2 per cent, also may be incorporated in the ointment. Corlett has found preparations containing resorcin valuable.

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TRICHOTILLOMANIA.

Synonyms.—Trichomanie; Tic de l'epilation.

Trichotillomania, the "trichomanie" of Besnier, is an affection which is characterized by an abnormal desire on the part of an otherwise apparently sane individual to extract forcibly one or more of

his own hairs. The impulse is seldom cyclic, but is as sudden as it is uncontrollable, and Raymond's designation of "tic de l'epilation" is not an inappropriate one. The scalp, the eye-brows and lashes,

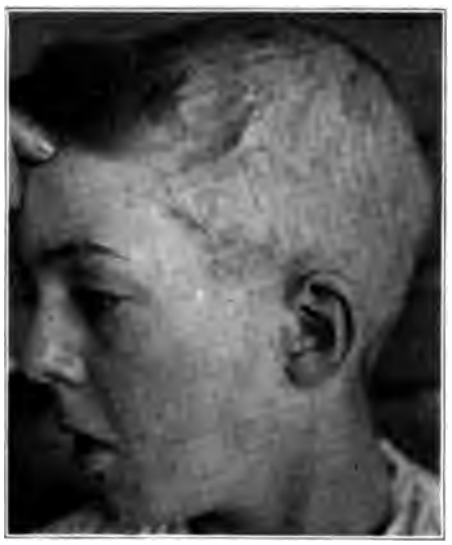

Fig. 390.—Trichotillomania.

Fig. 391.—Trichokyptomania.

and the beard are the parts most frequently attacked. *Trichokyptomania* is an allied disorder in which the patient breaks off the hairs instead of pulling them out. *Dermatothlasia* is a somewhat similar morbid state in which the affected individual possesses an ungovernable desire to rub, scratch or irritate the skin on one or several parts of the body.

Treatment.—The application of various antipruritics, such as phenol, menthol, camphor or tar, apparently has little or no effect on the course of the disease. Hallopeau has suggested the use of gutta percha and similar dressings of an impervious character. Probably a better plan would be to ameliorate the habit by keeping the hair shaved off for a period of several months.

Acarophobia is a peculiar mental disorder characterized by an abnormal fear on the part of the affected individuals that they are infected with some parasite. It may occur as a complication of a generalized pruritus, but occasionally develops independently of any cutaneous disorder. The patients will pick or rub off small particles of epithelial débris and insist that the masses contain numbers of the offending bacteria. Innumerable negative examinations of the material make no impression whatever upon them, but leave them as firmly convinced as ever that their integument is inhabited by a new species of small, but exceedingly industrious organisms which will eventually prove their undoing. On subjects other than the ailment the patients' minds are usually unaffected. The forcible removal of a few of the outermost corneous layers usually has a soothing effect on their minds, and after they have carefully destroyed the material and its supposedly dangerous contents, they are perfectly at ease until another exacerbation occurs. The condition is an extremely difficult one to combat successfully and its management constitutes a problem for the alienist rather than the dermatologist.

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CLASS VIII.—NEW GROWTHS.

MOLLUSCUM CONTAGIOSUM.

Synonyms.—Molluscum sebaceum; Molluscum epitheliale; Epithelioma molluscum; Epithelioma contagiosum.

Definition.—A mildly contagious disease of the skin characterized by the occurrence of small, waxy, globular, epithelial tumors which are whitish or pinkish in color and often have minute, rounded orifices at their apices.

Symptoms.—The lesions usually vary in size from a pin-point to a pin-head, and develop quite slowly. At first they are acuminate or

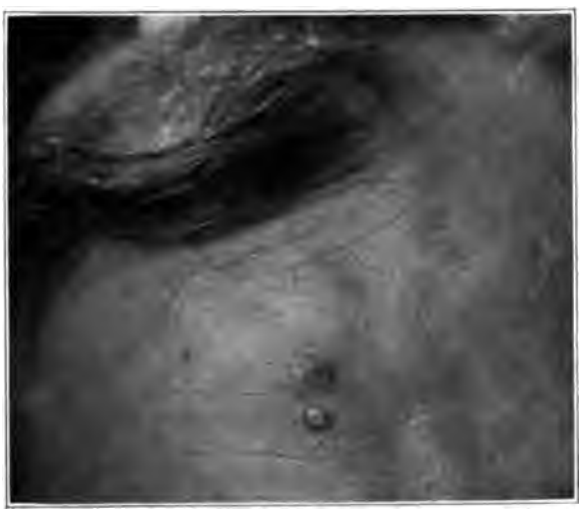

Fig. 392.—Molluscum contagiosum, showing two full-sized lesions on the forehead.

globular in shape, with broad bases, but as they grow larger they become slightly flattened and umbilicated, and the tiny dark point at the summit, which represents the follicular orifice, becomes more apparent. Pedunculation is rare. The lesions vary in number from two or three to a score or more, although Frick has reported an instance in which over 400 of the growths were present. The mucous surfaces, particularly the tongue and the vermilion border of the lips, are oc-

casionally involved. The lesions are at first quite firm and solid, but as they reach maturity they become somewhat softened, and ultimately a few may break down and suppurate, finally healing without scarring. Sometimes the tumors disappear spontaneously, but commonly, if untreated, they persist for many months. The sites of predilection are the face, particularly the eyelids, the breasts, the genitalia, and the inner surface of the thighs, although no region is exempt. The lesions are usually discrete, but may be grouped. They

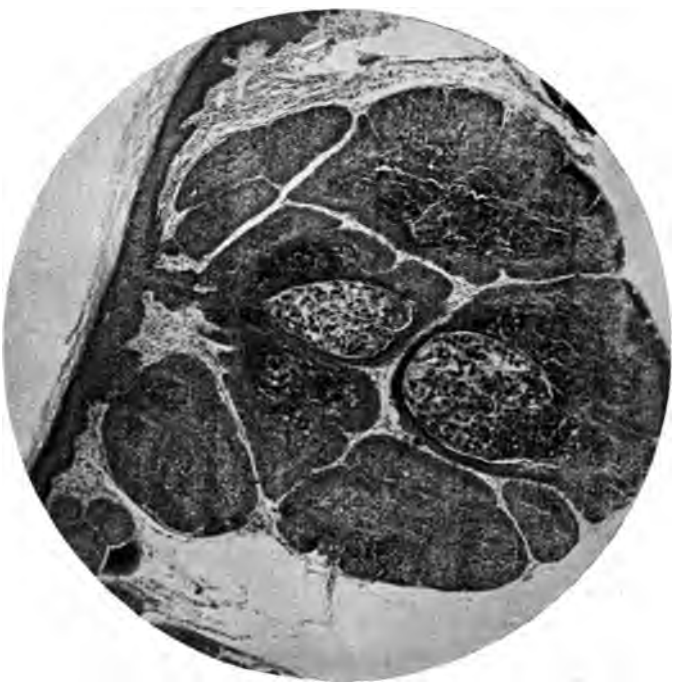

Fig. 393.—Molluscum contagiosum. Moderate magnification.

always retain their individual characteristics, however, and never become confluent. The little tumors give rise to no constitutional or subjective symptoms.

Etiology and Pathology.—The disease occurs in birds and in animals as well as in man, and is autoinoculable and undoubtedly contagious, although the causative agent is yet to be isolated. Accidental inoculation in physicians from their patients, during the course of examinations and surgical operations has been noted in several instances, and the affection has been experimentally reproduced by Vidal, Pick,

Nobel, Wile and Kingery, and others. The incubation period is two to ten weeks. The majority of the patients are children, and the inmates of children's homes and similar institutions are apparently more susceptible than youthful individuals who are being reared under more favorable circumstances. The histopathology has been exhaustively studied by Unna, Neisser, Piffard, McCallum, Hartzell, White and Robey, and a number of others. White studied several hundred sections cut from tumors sent him by Stelwagon and by Shepherd. A number of different staining methods were employed, but despite the most careful and thorough search no micro-organisms were found. Robey's cultural experiments likewise were negative.

According to White, the new growths are formed by a hyperplasia of the rete cells which push the mass downwards and outwards, thus producing globular tumors. Very often it appeared that the growth was the result of the combination of two or three downbuddings of the rete Malpighii.

The lowest layer of the cells in the tumor presented all the characteristics seen in these quasi-normal spinous cells, plus the appearance of well-marked nucleoli which were usually single or double, but might reach the number of three or four. These bodies stained very deeply when exposed to methylene-blue and were practically always present. In the midst of these cells were found others devoid of nuclei and composed of fine fibrillary protoplasm. The spinous processes of all these cells were retained.

Above these primary rows were found cells which had lost some of their normal attributes. Their nuclei had become distorted and assumed many shapes, but were still surrounded by the empty halo so characteristic of this process. Adjacent cells lost their nuclei and became unbounded masses of reticulated protoplasm, and stained only with the basic colors.

After this so-called secondary stage the field became more difficult to interpret. Many cells increased enormously in size, assumed many shapes chiefly through pressure; the nuclei became flattened and apparently pressed to one end of the cells, but remained always surrounded by empty zones; the cytoplasm grew more and more reticulated, its fibrillae simulating the walls of a honeycomb with irregularly placed trabeculae which still absorbed the nuclear dyes. This reticulation apparently began in the center of the cell and spread outward toward the periphery. The nuclei were found near the upper or near the lower pole of the cell, or might be entirely wanting. Karyokinetic

figures were often seen. In the midst of these large cells were frequently found others which had preserved their identity to a greater extent. Here the nuclei were large, and the protoplasm, like that of their cells, was finely granular, and received but faintly the coloring agent.

Still further toward the free surface other changes occurred. Here the nuclei and their surrounding halos were, for the most part, gone, and the whole cell, which was somewhat smaller in size, assumed the appearance of a multilocular cyst in which the trabeculae absorbed the basic stains and their contents, the acid dyes.

The next change was a very abrupt one, and apparently occurred without the observers being able to detect its steps, and here, for the first time they saw a field where all elements were apparently contemporaneous. From the distinct evidences of keratohyaline granules about these new-formed masses, it was perhaps proper to infer that the field lay in the stratum granulosum. Above this granular area the cells became much smaller, the trabeculae disappeared from the cytoplasm, and they found a homogeneous mass which, in its lower layers, seemed at times to be impartial to the dye it selected—enclosed by walls which suggested a close relationship to keratin near the free surface. These broke, leaving ample opportunity for the bodies to escape.

Where the tumor consisted of two or more lobules, which had finally approximated, leaving perpendicular walls or cells of the first-row type still clearly visible, this line of demarcation could be traced steadily upward. Curiously enough, these cells did not undergo the strange metamorphosis just described, but passed through the typical changes seen under normal conditions, resulting finally in the vertical septa of keratin.

Diagnosis.—The size, color and appearance of the lesions, together with the fact that the contents of the little tumors can readily be squeezed out through the central orifices, all are distinctive. Fibromata, milia, comedones, and particularly verrucae are to be excluded.

Prognosis and Treatment.—The disorder is a harmless one, but the lesions, if untreated, are sometimes persistent. If the growths are numerous, lotio alba, or, better, an ointment containing ammoniated mercury (5 per cent), may be prescribed. In the majority of instances it is better to incise the little tumors with a sharp bistoury, squeeze out their contents, and apply tincture of iodine to the inside

of the cavities by means of a bit of cotton on the end of a small probe or toothpick.

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XANTHOMA.

Synonyms.—Xanthelasma; Vitiligoidea.

Three varieties of xanthoma are recognized—xanthelasma or xanthoma palpebrarum, xanthoma tuberosum multiplex, and xanthoma diabeticorum.

Clinically, all are characterized by the occurrence of flat or slightly elevated, soft, rounded, chamois-colored plaques or nodules which are usually persistent, but never give rise to subjective symptoms.

Fig. 394.—Xanthoma palpebrarum. (Courtesy of Dr. Howard Morrow.)

Xanthoma Palpebrarum.

Symptoms.—In this variety, which is also known as xanthelasma, the lesions exhibit a preference for the orbital regions, and consist of rounded or oval collections of minute, closely aggregated, yellowish macules. Generally one or both lids of both eyes are involved.

Women are more often affected than men. Coalescence is not infrequent. Occasionally the plaque may develop on the neighboring cheek, but this is unusual. In rare instances the buccal mucous membrane is attacked. The lesions develop very slowly, and are at all times soft, velvety and compressible to the touch. The overlying epidermis appears thin, atrophic and wrinkled, but its surface is never harsh or scaly.

Fig. 395.—An unusually extensive case of xanthoma palpebrarum in a young woman.

Etiology.—Xanthoma palpebrarum is essentially a disease of middle or later life, and is a degenerative process involving the fibers of the orbicularis muscle.

Pathology.—Pollitzer, to whom we are indebted for much of our knowledge concerning the histopathology of the affection, has shown

that the lesions are the result of degenerative process, the muscle substance breaking down into fat (?). The cutis is practically filled with peculiar masses known as "xanthoma cells," which are really the frag-

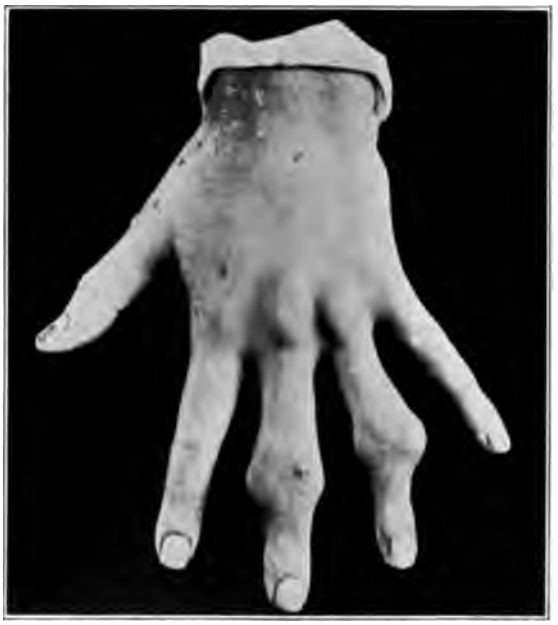

Fig. 396.—Xanthoma tuberosum multiplex, showing lesions on fingers. (Courtesy of Dr. R. Cranston Low.)

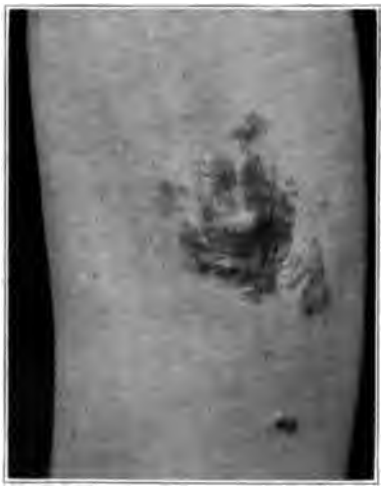

Fig. 397.—Xanthoma tuberosum multiplex. (Courtesy of Dr. Howard Fox.)

mented and degenerated remains of muscle fibers with proliferated sarcolemma and nuclei. There is some yellowish pigment matter, and much combined fat.

Diagnosis.—The character and distribution of the lesions, together with their history, and the fact that they seldom appear be-

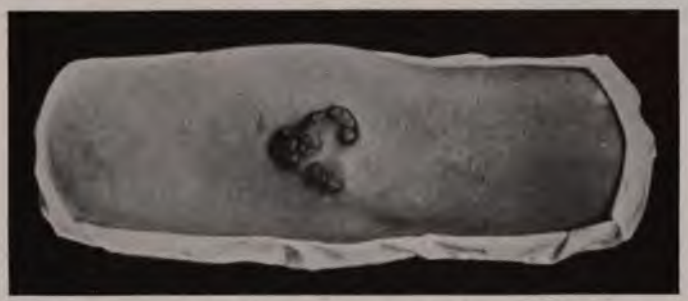

Fig. 398.—Xanthoma tuberosum multiplex, lesion on elbow. (Courtesy of Dr. R. Cranston Low.)

Fig. 399.—Xanthoma tuberosum multiplex, showing typical lesions on palm. (Dr. Elijah Miller's patient.)

fore the fourth or fifth decade of life, should serve to distinguish them.

Treatment.—Xanthelasma may be successfully excised, or removed with a microbrenner or by cauterization with monochloracetic acid.

Subsequent contraction of the cicatrices is liable to give rise to ectropion, however, and it is much safer to destroy the lesions by means of the galvanic needle or carbon dioxide snow. The latter has repeatedly given very satisfactory results in my hands.

Fig. 400.—Xanthoma tuberosum multiplex, lesion on elbow. (Courtesy of Dr. Frederick G. Harris.)

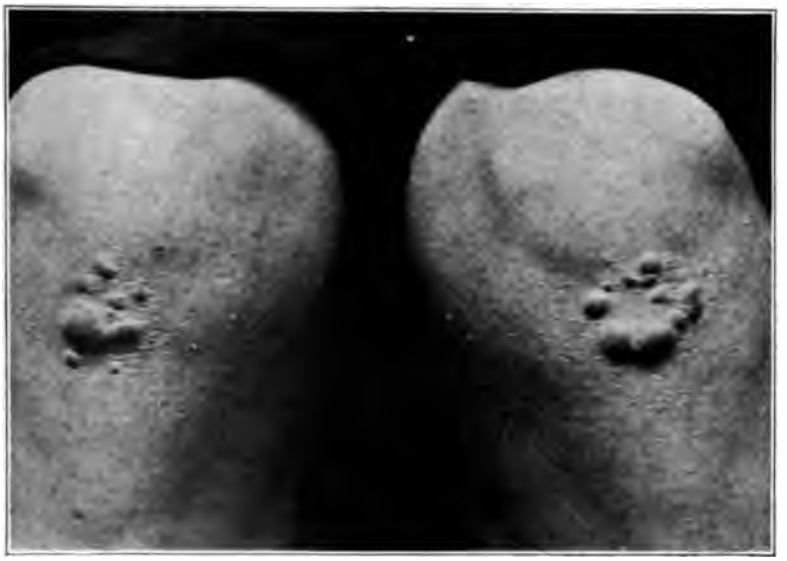

Fig. 401.—Xanthoma tuberosum multiplex, showing typical lesions on knees. (Courtesy of Dr. T. Caspar Gilchrist.)

Xanthoma Tuberosum Multiplex.

Symptoms.—In this variety the lesions are widely disseminated, and the eruption, which is more or less generalized in character,

may consist of papules, tubercles, nodules and even tumors, often intermixed with plaques and striae. The sites of predilection are the elbows, hips and knees, although no region is exempt. On the palms and soles the lesions are usually striated and ribbon-like, and

Fig. 402.—Xanthoma tuberosum multiplex in a negress. (Courtesy of Dr. Philip Frank Shaffner.)

because of their peculiar saffron color stand out in bold relief against the normal surrounding skin. In rare instances, as in a case reported by Lehzen and Knauss, the nodules may coalesce, forming oval, tumor-like masses several centimeters in diameter.

Fig. 403.—Xanthoma tuberosum multiplex of hands. (Courtesy of Dr. D. W. Goldstein.)

Fig. 404.—Xanthoma tuberosum. (Courtesy of Dr. Anstruther Davidson.)

The consistency of the lesions varies considerably, but as a rule they are soft or semisolid. As in xanthelasma they develop quite slowly, and seldom exhibit a tendency to involution, although instances of spontaneous regression have been noted by Hilton Fagge, Legg and others. In this variety also the mucous membranes are attacked and instances have been reported in which the conjunctivae, the palate, the trachea, and even the structures comprising the gas-

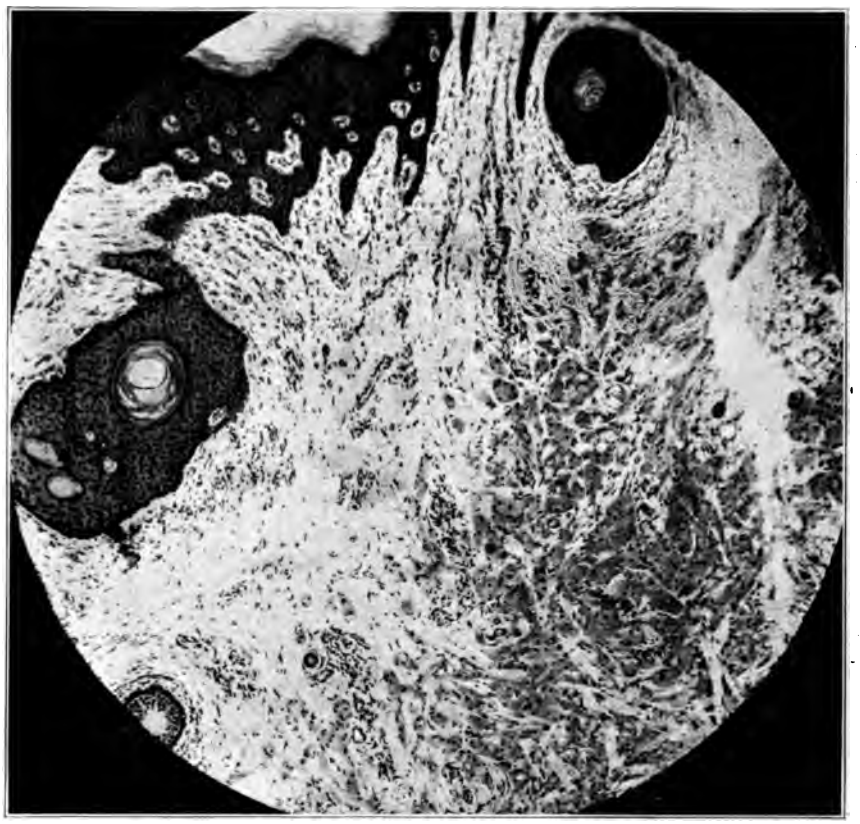

Fig. 405.—Xanthoma tuberosum multiplex vulgaris. Low magnification. Dr. Leon Rosenwald's case. (Courtesy of Dr. Otto Leslie Castle.)

trointestinal tract have been involved. In 1918, Stillians exhibited before the Chicago Dermatological Society a Roumanian Jewess, aged forty-two, who presented typical lesions of both xanthoma palpebrarum and xanthoma tuberosum multiplex.

Etiology and Pathology.—The exciting cause of xanthoma is not known, although Pollitzer has demonstrated the nature of the local

changes which occur in the affected areas. The affection is a rare one. Both children and adults are affected. A few congenital examples have been reported. Török has recorded an instance in which three generations were affected, and a family prevalence has been noted by Mackenzie, Thiebierge, myself and others. In a considerable percentage of the reported cases there has been associated hepatic disease, and jaundice is a frequent concomitant symptom. The histology of the condition has recently been exhaustively studied by Pollitzer and Wile. These authors

Fig. 406.—Xanthoma tuberosum multiplex. Moderate magnification.

conclude that "xanthoma tuberosum represents an irritative connective tissue hyperplasia, in which the extravasation of cholesteral-fatty-acid present in the blood, serves as a stimulus.

"The first change appears in the adventitial connective tissue cells of the smallest blood vessels of the papillary and subpapillary layers, which take up the lipoids poured out from the vessels, proliferate and increase in size, ultimately forming the typical xanthoma cells. The presence of lipoids in the cells does not appear to affect their

Fig. 407.—Frozen section of a mass from tendon sheath of finger stained with hematoxylin and Sudan iii, showing transition stage from fibrous tissue to "xanthoma." (Courtesy of Dr. R. Cranston Low.)

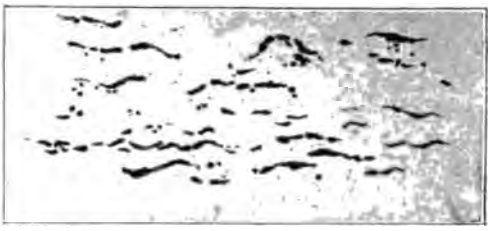

Fig. 408.—Xanthoma mass from tendon sheath, showing transition stages; droplets of fatty substance in connective tissue cells. (Courtesy of Dr. R. Cranston Low.)

Fig. 409.—Xanthoma diabeticorum. (Courtesy of Dr. E. Wood Ruggles.)

vitality, except in older tumors, where the layers adjacent to a vessel may become completely obliterated by the lipoidal infiltration.

"The proliferation of the perivascular cells acts in turn as a stimulus to the development of connective tissue which, as fibroblasts and collagenous bundles, surrounds the nests of xanthoma cells and ultimately predominates over the true xanthomatous elements."

Diagnosis.—The disorder is to be differentiated from urticaria pigmentosa. In well-defined examples of either disease confusion is not likely to occur, but in atypical cases resort must sometimes be had to a microscopic examination.

Clinically, the presence of itching and dermographism should serve to distinguish the urticarial disorder. Pollitzer has called attention to the fact that multiple dermoid cysts may simulate xanthoma, and in a case under my own care (through the courtesy of my friend, Dr. Leon Rosenwald) the histological resemblance of the lesions to those of leiomyoma was so great that it confused several of the most eminent skin pathologists in America and Europe.

Prognosis.—The lesions generally progress to a certain stage and then remain stationary. They seldom, if ever, disappear spontaneously.

Treatment.—Besnier advises phosphorus dissolved in cod-liver oil, to be followed, at the end of a few weeks, by small doses of turpentine. The main reliance, however, is to be placed on surgical procedures. Stelwagon recommends the local application of trichloracetic acid, pure or diluted one-half with water. The galvanic current, carbon dioxide snow, or liquid air may be tried. Morrow noted improvement following the repeated use of salicylic acid plaster (25 per cent).

Xanthoma Diabeticorum.

Symptoms.—This variety, which was first described by Addison and Gull in 1851, is exceedingly rare. The majority of the few reported cases have occurred in glycosuric individuals. The lesions exhibit a predilection for the buttocks, elbows and knees, and are firm, solid, rounded or oval, reddish papules, measuring from 0.5 to 1.0 cm. in diameter. Their apices are crowned by yellowish, solid tips, which superficially resemble pustules. Frequently there are associated telangiectases. The lesions may be tender or even painful, and sensations of itching and pricking are not uncommon. They develop suddenly, and while generally discrete and few in number, may be very numerous. Occasionally they coalesce, forming rough, nodular plaques. After persisting for several months, or years, the

papules disappear spontaneously, leaving no trace. Relapses are of fairly common occurrence.

Etiology.—The majority of the recorded cases have been in adult males. Glycosuria is an almost constant accompaniment, and al-

Fig. 410.—Xanthoma diabeticorum. (Courtesy of Dr. Philip Frank Shaffner.)

buminuria also is not infrequently present. As Crocker has stated, however, the patients are usually stout and well conditioned.

Pathology.—Johnston has shown that the xanthoma nodules are

essentially inflammatory, and remain localized in the corium throughout their course. The process commences in the sheaths of the blood vessels of the reticular layer, and extends along these channels to the papillae and subcutaneous tissue. The so-called "xanthoma cells" are probably endothelial cells which by a process of

Fig. 411.—Xanthoma diabeticorum, in an adult male. (Courtesy of Dr. Philip Frank Shaffner.)

fusion and nuclear division, have been transformed into giant cells, and these structures have, in turn, undergone fatty degeneration. The connective tissue exhibits hyaline changes in many areas, and fat infiltration is a characteristic feature. The elastic tissue is unchanged.

Diagnosis.—The disease is characterized by the distribution, character and color of the lesions, their sudden development in obese individuals with glycosuric histories, and the accompanying subjective symptoms. The only affection with which it is likely to be confused is xanthoma tuberosum. In the latter malady the lesions develop very gradually and are usually permanent in character. They are soft and give rise to no subjective symptoms.

Prognosis.—Recovery in from a few months to a few years is the rule.

Treatment.—The disorder responds promptly and favorably to the usual antiglycosuric measures. Arsenic also has proved serviceable in a few instances.

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XANTHOMA TUBEROSUM MULTIPLEX.—*Pollitzer and Wile,* Jour. Cutan. Dis., 1912, p. 235. — *Knowles,* Jour. Cutan. Dis., 1914, p. 288. — *Gottheil,* Jour. Cutan. Dis., 1908, p. 133. — *Winnfield,* Jour. Cutan. Dis., 1909, p. 112. — *Török,* Ann. de dermat. et de syph., 1893, pp. 1109 and 1261. — *Whitehouse,* Jour. Cutan. Dis., 1904, p. 470. — *Cranston Low,* Brit. Jour. Dermat., 1910, p. 109. — *Sutton,* Jour. A. M. A., 1912, lix, p. 178. — *Fischkin,* Jour. Cutan. Dis., 1910, p. 419. — *Lehzen and Knauss,* Virchow's Arch., cxvi, p. 85. — *Stillians,* Jour. Cutan. Dis., 1918, p. 472.—*Kavitch,* Jour. Cutan. Dis., 1918, p. 303.—*Davidson,* Calif. State Jour. Med., 1918, xvi, p. 333.

XANTHOMA DIABETICORUM.—*Morris,* Tr. Path. Soc. London, 1883. — *Johnston,* Jour. Cutan. Dis., 1900, p. 387. — *Pusey and Johnstone,* Jour. Cutan. Dis., 1908, p. 552. — *Winfield and Potter,* Jour. Cutan. Dis., 1909, p. 112.

PSEUDOXANTHOMA ELASTICUM.

Synonym.—Xanthoma elasticum.

This exceedingly rare affection was first described by Balzer, in 1884, and is characterized by the occurrence of pinhead- to pea-sized, flat, yellowish papules over the flexor folds, on the abdomen, near the axillae, and on the upper and inner surfaces of the thighs. The eyelids and the mucous membranes are not affected. The lesions give rise to no subjective symptoms, but are very persistent (in Bodin's patient, a man of fifty, the case was of thirty years standing). Histologically, Balzer found large coils of degenerated and swollen elastic tissue in the vicinity of the follicles. Bodin describes the occurrence of peculiar giant cells, consisting of masses of nuclei imbedded in small amounts of protoplasm.

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PSEUDOXANTHOMA ELASTICUM.—*Balzer,* Arch. de Physiologie, iii x, 1884, p. 65. — *Dubenhorfer,* Arch. f. Dermat. u. Syph., 1903, lxiv, p. 175. — *Bodin,* Ann. de dermat. et de syph., 1900, x, p. 1073. — *Darier,* Tr. 3d Internat. Cong., 1896, p. 289. — *Unna,* Histopathology.

COLLOID DEGENERATION OF THE SKIN.

Synonyms.—Hyaloma; Colloid milium.

Definition.—A chronic affection of the skin, characterized by the occurrence of pinhead- to split-pea-sized, rounded, yellowish pellucid nodules.

Symptoms.—The disorder was first described by Wagner, in 1866, and is extremely rare, only about a score of cases having been reported. The lesions develop gradually and occur, as a rule, on the forehead, nose and cheeks. In White's case the backs of the hands also were involved. The nodules are pale orange-yellow in color, and of firm consistency. They exhibit a tendency to grouping, but never coalesce. Superficially they resemble vesicles, but when incised only small amounts of a gelatinous substance can be squeezed out. They give rise to no subjective symptoms, but are very persistent and seldom disappear spontaneously.

Etiology and Pathology.—The cause of the disease is not known. The majority of the reported cases have occurred in adults. The sexes are about equally affected. Long continued exposure to the weather may be a factor. Wagner believed the condition to be due to degeneration of the sebaceous glands (hence the designation of "colloid milium"), but later investigators—Balzer in France, and C. J. White and Hartzell in America—have clearly demonstrated the fact that neither the sebaceous nor coil glands are directly involved. The principal changes occur mainly in the connective tissue of the corium, especially in the periglandular regions, and consist of colloid degeneration of both the collagen and the elastic fibers. In Hartzell's case, as in the ones studied by Hyde and Bosselini, some of the cells in the prickle layer also were affected. Philippson's contention that hydradenoma, benign cystic epithelioma, and colloid degeneration all represent one and the same process has few supporters.

Diagnosis.—The disease is to be differentiated from ordinary milium, xanthoma, hydrocystoma, syringocystadenoma, adenoma sebaceum, and benign cystic epithelioma. In cases of doubt, resort must be had to a biopsy.

Treatment.—The nodules may be destroyed by means of the electric needle, or by deep freezing with carbon dioxide snow. French authorities recommend the use of the curette.

Dermolysis.—Under the title of "Dermolysis," C. J. White has described a condition somewhat resembling colloid degeneration of the skin, but differing from it in several essentials. The patient

was a Russian, a baker, aged 25, and the eruption, which was limited to the elbows and the suprapatellar regions of the thighs, consisted clinically, of firm, round, dome-shaped, cherry-colored, pea-sized papules. The youngest lesions were approximately 10 cm. in their long diameter, and were composed of peripherally set, contiguous but distinct, flat-topped, muddy white, softish papules, 1.5 cm. in diameter, arranged in an oval or circle, around a central, blue red, relatively sunken, velvety skin. When the skin was put on the stretch the arrangement was suggestive of a "sapphire brooch surrounded by pearls." Histologically there were "conspicuous epidermal changes; endarteritis, perivascular, perifollicular and periglandular lymphocytic infiltration; basophilic collagen; colastin; general diminution of collagen and elastin; and lastly, gradual disappearance of all these structures focally."

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DERMOLYSIS.—*C. J. White*, Jour. Cutan. Dis., 1902, p. 49.

CICATRIX.

Synonyms.—Scar; Scar-tissue.

Definition.—Scars are connective tissue new formations which replace normal structures that have become lost as a result of trauma or disease.

Symptoms.—Scars are whitish, pinkish or reddish in color, and of firm consistency. Their outline roughly approximates that of the lesions in which they develop. Their surface may be depressed below the level of the surrounding skin (atrophic scars), on a plane with it, or slightly elevated above it (hypertrophic scars). The most insignificant cicatrices are those resulting from clean-cut, incised wounds. In variola and in syphilis the lesions are atrophic in character, white, soft and pliable. Hypertrophic scars develop, as a rule, from burns and similar injuries, and following deep, lacerated or infected wounds of considerable magnitude. They never extend laterally beyond the boundaries of the original injury (a fact which distinguishes them from keloid), and in the majority of instances they tend to retrogressive changes. Subjective symptoms are commonly absent. If present, they are usually burning or pricking in character, and result from pressure on one or more nerve filaments that have been caught in the sclerotic mass.

Etiology.—Any injury which involves the derma will ultimately give rise to the formation of scar tissue.

Pathology.—The growths consist of irregularly arranged bundles of moderately coarse connective tissue fibers. In the smaller lesions a thin layer of rete may bridge over the interspace and form a covering for the new growth, but as a rule this does not occur. The skin glands and hair follicles are of course absent.

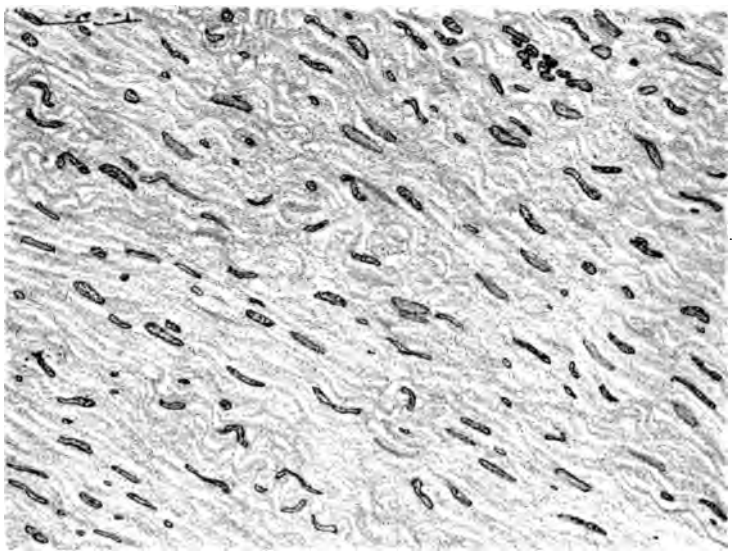

Fig. 412.—Section from a scar. Moderate magnification. (Courtesy of Dr. Arthur E. Hertzler.)

Treatment.—Irregular or hypertrophic scars which give rise to more or less disfigurement can be excised, the area afterward being covered by grafts, or their surface can be rendered smoother and less conspicuous by the use of carbon dioxide snow, the x-rays, or radium. Injections of thiosinamine have been recommended, but have proved both painful and ineffective in my hands.

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KELOID.

Synonyms.—Kelis; Cheloid; Alibert's keloid.

Definition.—A dense fibrous growth which develops in the subcutaneous tissue, usually at the site of a scar, and is characterized clinically by one or more smooth, firm, reddish, scar-like tumors.

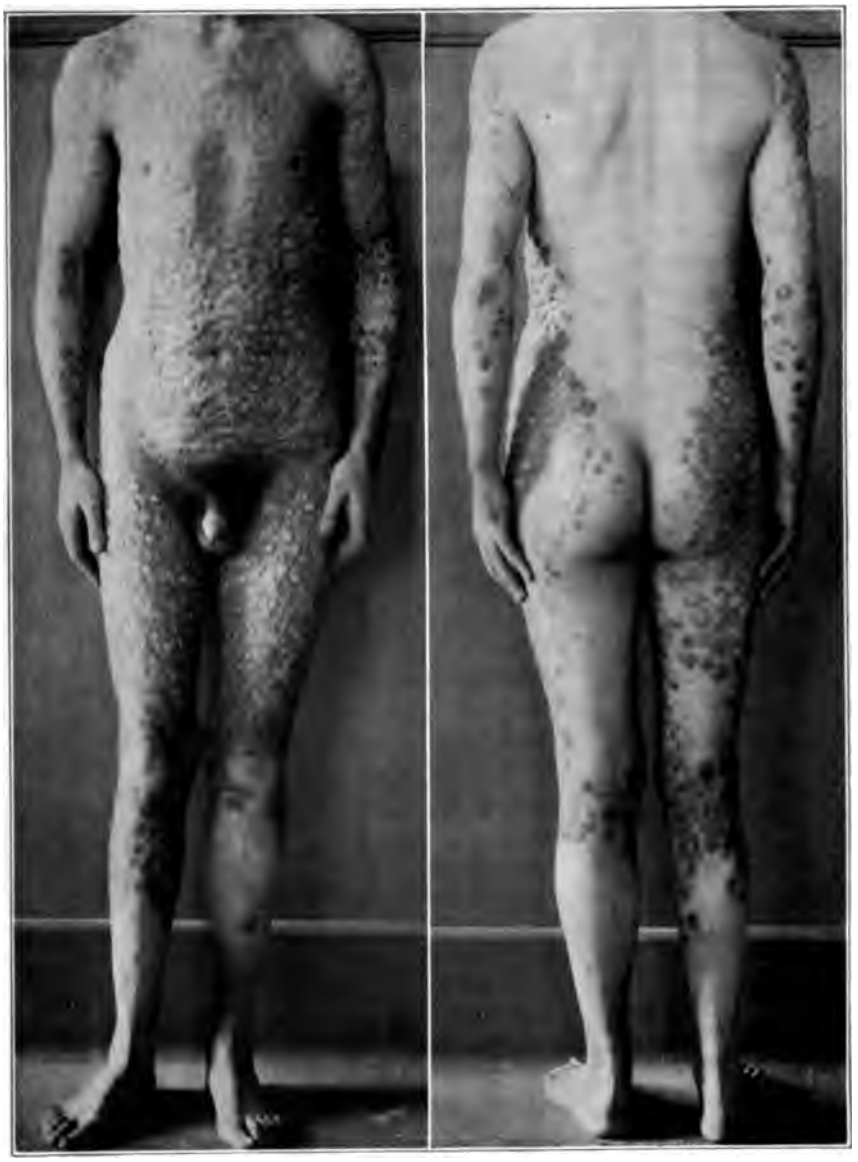
Symptoms.—Keloids were formerly separated into two distinct groups—a true, spontaneous, or idiopathic variety which developed

Fig. 413.—Keloids of hand and forearm following gasoline burn.

Fig. 414.—Keloids of face, following powder burn. (Courtesy of Dr. Harold N. Cole.)

from apparently normal tissue, and a false, or cicatricial, form which always originated in a previously existing scar. This distinction is

entirely theoretical, however, and should be discarded, for the growths are genetically the same and cannot be differentiated either pathologically or clinically.



A *B*

Fig. 415.—Keloids following needle punctures in a drug addict. (Courtesy of Dr. J. B. Shelmire.)

The growths develop very gradually, the first appreciable lesion generally being a deeply seated, firm, reddish, dome-shaped nodule, the surface of which is traversed by one or two minute, tortuous capillaries. When fully developed, the growths are oval, elongated or irregular in outline, frequently with claw-like lateral projections.

Fig. 416.—Keloid, with large fibroma in right parotid region. (Courtesy of Dr. Arthur E. Hertzler and Dr. W. L. Hollister.)

Fig. 417.—Keloid. The tumor in the right parotid region is a fibroma. (Courtesy of Dr. A. E. Hertzler and Dr. W. L. Hollister.)

They vary from a pinhead to a plate in size, and may consist of a single globular mass or of a lobulated collection of tumors. In number they vary from one or two to a hundred or more. After attaining a certain size they may remain stationary, or may undergo partial or complete involution. Ulceration is rare, but does occur. Anderson has reported a case in which both ulceration and malignancy were present. The lesions are generally tender, and are fre-

quently the seat of spontaneous pain. The sensations are burning or pricking in character, and in one patient under my care they were particularly troublesome just prior to sudden and marked barometric changes.

Etiology.—The essential cause of keloid is unknown. Predisposition is undoubtedly a strong factor in many instances. Hutchinson and others have noted a family tendency to the disorder. Negroes are especially susceptible.

Pathology.—The growths are characterized histologically by very large homogeneous fibers interspersed with a few connective tissue cells having small, intensely staining nuclei (Hertzler). The skin glands and hair follicles are pushed aside by the tumor and may exhibit atrophic changes or be the seat of profuse round-cell infiltration.

Diagnosis.—The color, consistency, configuration and history of the lesions should serve for recognition.

Prognosis.—The growths are persistent, and spontaneous regression seldom occurs. They respond favorably to appropriate treatment, however, and in the majority of instances marked improvement can safely be promised.

Treatment.—Of the numerous remedies and methods of treatment that have been suggested, only three, the x-rays, radium, and carbon dioxide snow, have proved satisfactory in my hands. In attacking extensive growths, the x-rays are the most effective, but in getting rid of the smaller lesions great reliance may safely be placed on repeated refrigeration with carbon dioxide snow. Simpson speaks highly of radium, and I have found the agent a valuable aid in getting rid of keloids of small or moderate size. Multiple linear scarification sometimes proves helpful, but cauterization and excision are to be strictly avoided. Porter believes that successful excision is possible if contamination of the wound by keloidal tissue is strictly avoided. Ularic (cited by Ormsby) has reported successful results following the injection of 5 to 10 per cent solutions of creosote in olive oil. Thiosinamine also has been recommended, but in my experience this agent has been a failure. Smyth has suggested the injection of small quantities of formalin, particularly in the treatment of keloids of the ear. Electrolysis has proved beneficial in a few instances.

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DERMATITIS PAPILLARIS CAPILLITII.

Synonym.—Acne keloid.

Definition.—An exceedingly chronic inflammatory process involving the skin in the region of the nucha characterized by the occur-

Fig. 418.—Keloid, following burns.

Fig. 419.—Keloid. Moderate magnification. (Courtesy of Dr. Arthur E. Hertzler.)

rence of nodular lesions presenting a mixed sycosiform and keloidal aspect.

Symptoms.—The disease begins with the formation of a few or several, rounded or acuminate, pinhead-sized nodules in the region of the nucha, just at the border of the hair. The little tumors are reddish in color and firm in consistency, and sometimes tend to coalesce, forming rough, keloidal plaques. In size they vary from that of a pinhead to that of a cherry. On section they are hard

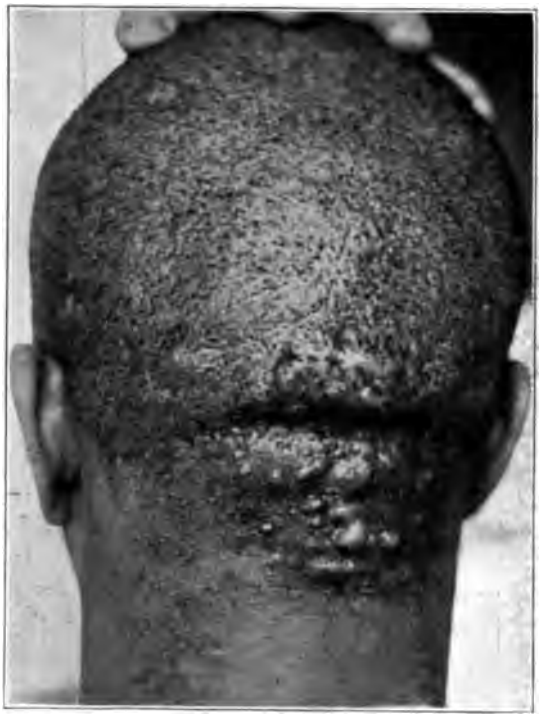

Fig. 420.– Dermatitis papillaris capillitii. (Courtesy of Dr. C. D. Trask.)

Fig. 421.—Dermatitis papillaris capillitii. (Courtesy of Dr. Howard Morrow.)

and gristly. When punctured they bleed freely. Pustules may spring up between the lesions, or the entire group may become undermined and boggy, with circumscribed subcutaneous abscesses. Superficial ulceration also is not infrequent. Tufts of twisted, broken hair project at many points through the nodules. The disease is usually confined to the region of the nucha, but may extend upward and involve the occiput or even the vertex of the scalp. The lesions seldom give rise to any subjective symptoms.

Etiology and Pathology.—The cause of the disease is not known, but as Adamson has stated, a combined microbic and traumatic origin

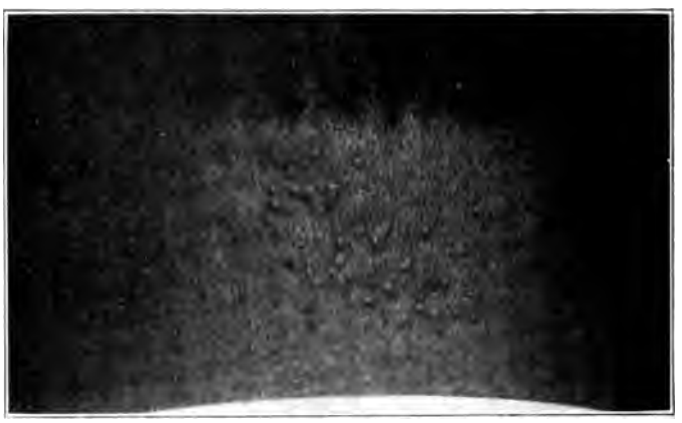

Fig. 422.—Dermatitis papillaris capillitii.

seems probable. Friction from the collar edge undoubtedly plays an important part in many instances. Kaposi considered the disorder a chronic inflammatory affection possibly due to bacterial infection, with associated connective tissue hyperplasia and resultant pressure atrophy of the contiguous follicles and skin glands. The results of Adamson's investigations (in three cases of the malady) tend to support Kaposi's conclusions. In one case under my observation the malady appeared to bear some relationship to an inflammatory affection of the tonsils, and when these organs were extirpated the cutaneous disorder practically disappeared.

Diagnosis.—The affection may be confused with acne vulgaris and with sycosis, but the localization and character of the lesions usually are sufficiently distinctive to render recognition easy.

Prognosis.—The lesions do not tend to spontaneous regression, and they are usually extremely rebellious and resistant to treatment.

Treatment.—The best results follow the employment of radiothe-

rapy. The nodular masses can be destroyed by means of repeated freezing with carbon dioxide snow. If large collections of pus are present, surgical procedures are indicated. Van Harlingen (cited by Stelwagon) recommends thorough destruction with the galvanocautery. In the milder examples, epilation, followed by the daily application of sulphur (15 per cent), ichthyol (10 per cent), or ammoniated mercury (10 per cent), ointment sometimes proves helpful.

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NÆVUS PIGMENTOSUS.

Synonyms.—Mole; Pigmentary mole; Mother's mark; Nævus spilus.

Definition.—Pigmentary nævi are congenital lesions characterized by areas of pigmentation with or without structural alterations in the skin.

Symptoms.—In color, pigmentary nævi vary from a pale fawn or light yellow to black, and in size from that of a pinhead to lesions measuring many square centimeters in extent. In rare instances, as in the so-called "bathing-trunk" cases, very large areas, and even the entire trunk, may be involved. The larger growths are identical in character with the smaller, although there may be an exaggeration of certain features (Pusey). The lesions may be single or multiple. In outline they are usually rounded or oval, but in shape, as well as in distribution, they are subject to great variation. They are usually congenital, or appear during the first year of life, but their development may be delayed until later childhood or even puberty has been reached. According to the character and preponderance of the associated cutaneous changes, various descriptive terms have been applied to the lesions. Thus "nævus spilus" means a pigmented macular nævus, "nævus pilosus," a hairy nævus, "nævus papillomatosus" and "nævus verrucosus," nævi which are covered with soft or hard, papillary excrescences, "nævus lipomatodes," fatty growths developing in association with nævi of other varieties and types.

Crocker emphasizes a point which was first suggested by Hutchinson that occasionally growths precisely similar to elevated nævi exist without any pigment. These "white moles" may be large, corrugated and cerebelliform. Such cases have been reported by Crocker and by Monsell Moullin, and I at one time encountered an

PLATE VI.

Nævus Linearis, moderate magnification. (Courtesy of Dr. Menahem Hodara.)

Fig. 423.—Pigmentary nævus on the breast of a woman, aged 35. Lesion was chamois-skin colored, and had been present since birth. (Courtesy of Dr. R. A. C. Wollenberg.)

Fig. 424.—Pigmentary, hairy nævus of the arm.

Fig. 425.—Nævus verrucosus. (Courtesy of Dr. J. B. Kessler.)

example in a Swedish farm laborer, a man, aged 43. There were two of the growths, both located on the dorsal surface of the trunk. The larger measured fully 10 by 18 centimeters.

Stokes has reported an extraordinary case of new growth in which the neoplasm consisted of a nævus syringadenomatosus papilliferus and a granuloma.

Fig. 426.—Nævus pigmentosus et verrucosus. (Courtesy of Dr. J. C. White.)

Linear Nævi (Nævus Lateralis; Nævus unius lateris; Ichthyosis linearis neuropathica) are, as their name suggests, nævoid growths of various types which are arranged in lines or streaks. They may be uni- or bi-lateral, pigmented, papillary, verrucose, or comedo-like. Mixed examples of nævi, presenting both pigmentary and vascular lesions, have been reported. As a rule, the growths increase in size up

to a certain point, and then persist indefinitely unchanged. Spontaneous regression seldom occurs. Wise has reported some beautiful examples.

Etiology.—The sexes are about equally affected. In the linear cases many theories have been suggested to explain the peculiar configuration of the lesions. D. W. Montgomery has made an exhaustive study of the

Fig. 427.—Nævus pigmentosus et verrucosus. (Courtesy of Dr. J. C. White.)

literature of the condition, and found that no less than forty-eight different designations have been proposed for the disorder, each appellation being to some extent dependent upon what the author thought to be the etiologic factors involved. He found the most generally accepted theories to be:

1. The lines follow the course of the cutaneous nerves;
2. The lines run along the so-called Voigt's lines;
3. The lines follow the lines of cleavage of the skin;
4. The lines follow the course of the blood vessels;
5. The lines run in the metameres or segments of the body;
6. The lines lie along the embryonic sutures, and follow the trend of growth of the tissues.

Fig. 438.—Pigmentary hairy nævus of abdomen.

Pathology.—As Unna has stated, there exist, both clinically and histologically, very striking differences in the lesions, particularly in nævi of the linear type. There may be present hyperplasia of almost any cutaneous structure. The changes may be confined to the sebaceous glands and periglandular structures, to the follicles, or to the corneous stratum. The deeper layers of prickle cells are less sharply defined than in normal skin. The pigmentation is mainly

due to the presence of large quantities of melanin. In the corium one finds in addition to an occasional giant and pigment cell, masses of peculiar, cuboidal cells arranged in columns or rows extending

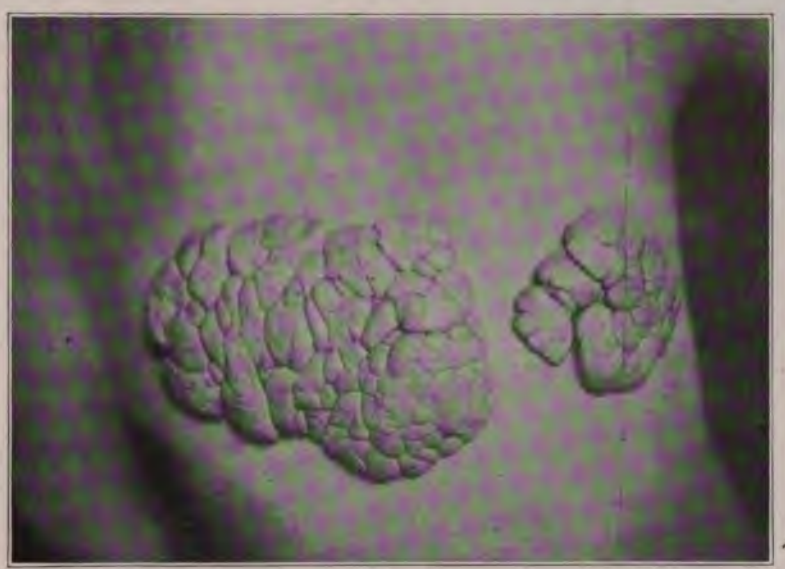

Fig. 429.—Cerebelliform mole.

Fig. 430.—Vascular nævus, the so-called "Port-Wine stain."

Fig. 431.—Vascular nævus, with associated cutaneous horn.

obliquely downward from the basal layer of the epidermis. These cells have large, oval, vesicular nuclei, and are very probably epidermal in origin (Unna, Whitfield).

Prognosis.—The lesions sometimes become malignant, a fact which should always be borne in mind, and which should be communicated to the patient.

Treatment.—Dime-sized or smaller growths may be readily destroyed by means of the electric needle, or with carbon dioxide

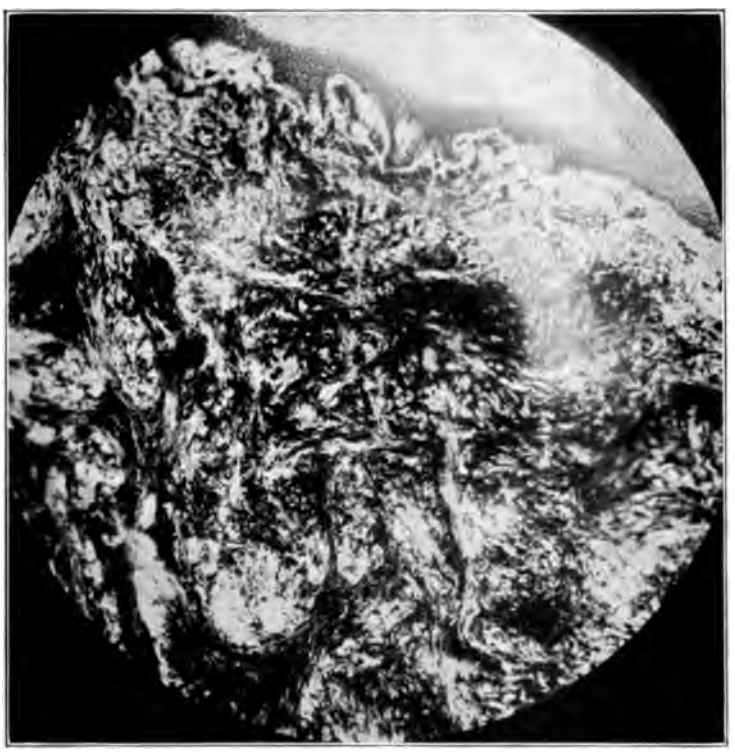

Fig. 432.—Pigmentary nævus. Moderate magnification.

snow. Recently Wickham, Simpson, and others have recommended radium for this purpose, and in several instances I have found it a valuable and effective remedy. Excision is an excellent plan, provided the loss of tissue will not give rise to disfigurement, and this method should always be employed if the lesions exhibit evidences of inflammation. In hairy growths the hairs may be removed by electrolysis, thus ameliorating the disfigurement, or the lesions may be excised *in toto*, and the area covered with skin grafts. Pusey has secured excellent results following x-radiation in these cases.

NÆVUS VASCULARIS.

Synonyms.—Birth-mark; Angioma; Nævus vasculosus; Capillary nævus.

Definition.—A vascular nævus is a localized congenital hyperplasia of the cutaneous or subcutaneous vascular tissue.

The lesions may involve the derma, the subcutaneous tissue, or both. They vary greatly in size, but are usually reddish or purplish in color, with a flattened surface, which is on a level with, or slightly elevated above the general level of the skin. Anatomically vascular nævi may be separated into three groups: (1) Flat, or slightly elevated, tumors composed of a superficial plexus of dilated capillaries (angioma simplex; nævus flammeus; port-wine stain); (2) Hypertrophic angiomata, made up of an interlacing network of blood vessels of considerable size (angioma plexiforme; angioma simplex hyperplasticum); (3) Cavernous nævi (angioma cavernosum).

Symptoms.—*Simple angiomata* are congenital, or appear shortly after birth, and vary in size from that of a pinhead to that of a palm. They are rounded or irregular in outline, usually slightly elevated and reddish or purplish in color. The sites of predilection are the face, head, neck and arms, although the lesions may develop in other regions. They may be very small at birth, and gradually increase in size up to a certain point, when they remain stationary. Or, they may undergo involution and ultimately disappear, leaving white or pigmented, atrophic scars. The capillary, or "port-wine mark" variety is of fairly common occurrence, and in some instances may involve large areas. *Hypertrophic vascular nævi* are more or less elevated, with a nodular or lobulated surface. The tumors are pea- to walnut-sized, purplish in color, and soft and compressible. During periods of exertion, they are temporarily increased in size. The lesions may ulcerate or rupture, and give rise to serious hemorrhage.

Cavernous nævi are generally more deeply seated than either of the two preceding varieties. They are usually globular or lobulated, and of a deep purplish color. They develop slowly, and may cause serious destruction of the tissues by mechanically shutting off the blood supply. Occasionally they give rise to severe pain.

Angioma Serpiginosum.—Hutchinson, J. C. White, Crocker and, more recently, Wise, and Stillians, have called attention to a peculiar type of vascular nævus which is characterized by multiple telangiectases which

may start from a congenital vascular nævus but which often arises without any appreciable pre-existing lesion of the skin. The mode of extension is by the occurrence of satellite lesions which later coalesce to form

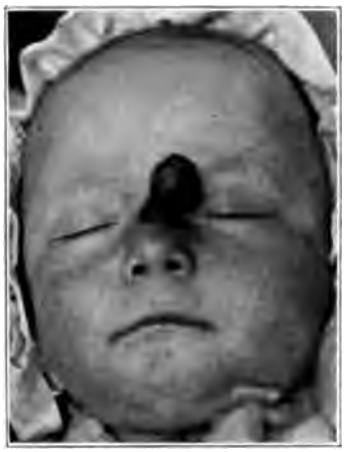

Fig. 433.—Vascular nævus.

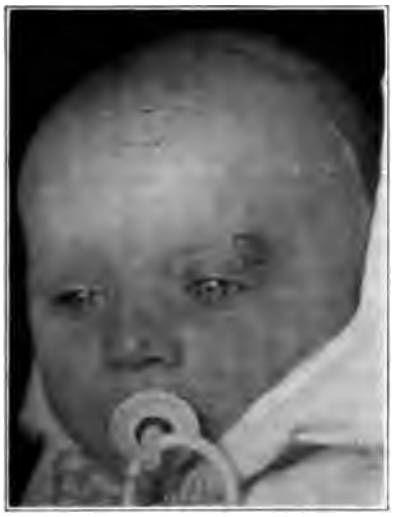

Fig. 434.

Fig. 435.

Figs. 434 and 435.—Vascular nævus (angioma) of the eyebrow, showing effect of radium treatment.

larger patches. Apparently there are no associated changes in the blood or internal organs, and the general health of the patient is unaffected. I have had under observation one case of the disease, in

a male patient, aged 20, referred to me by Dr. Sevier, of Richmond, Mo. New lesions have developed from time to time, and the disease has slowly extended until, from a minute, almost imperceptible, capillary dilatation in the right cervical region, at the end of three years it involves almost the entire side of the neck and the adjacent shoulder.

Etiology and Pathology.—The cause of nævi is not known. Unna

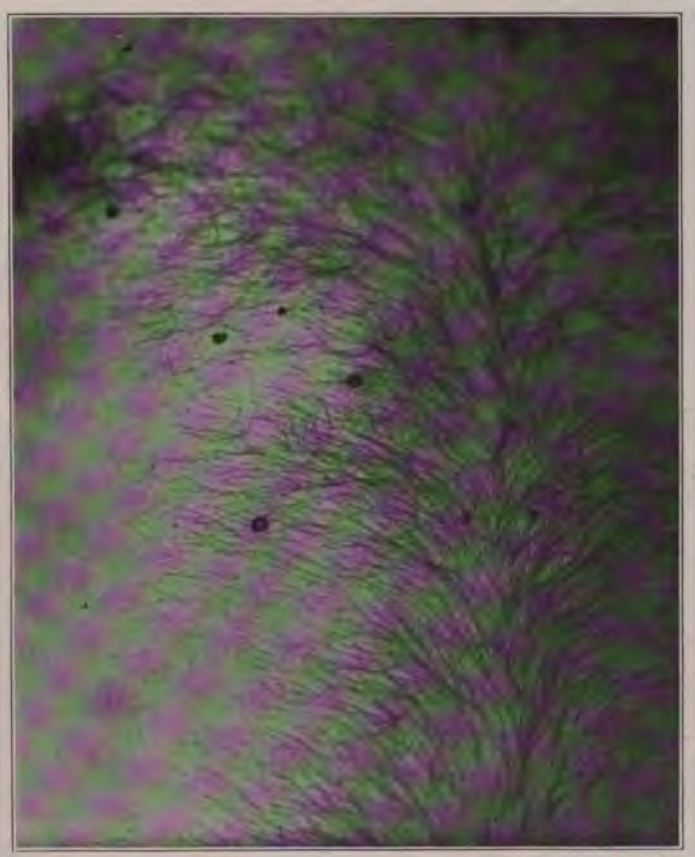

Fig. 436.—Vascular nævi, the so-called "cayenne pepper" type.

believes that intrauterine compression plays some part in the etiology, and Virchow has called attention to the anatomic relationship of the lesions to the embryonic fissures of the skin. The lay theory of prenatal maternal impressions has no scientific basis, and is in all probability erroneous.

Histologically, capillary nævi are simply abnormal growths made up of dilated capillaries and connective tissue. They receive their blood supply entirely through the deeper underlying vessels, and have no direct communication with the normal blood vessels of the corium (Ribbert, cited by Pusey).

Diagnosis.—Vascular nævi are to be differentiated from hematomata and from encephalocele. The latter may be recognized by its location, lobulation, distention (during periods of exertion), and the presence of a double pulsation.

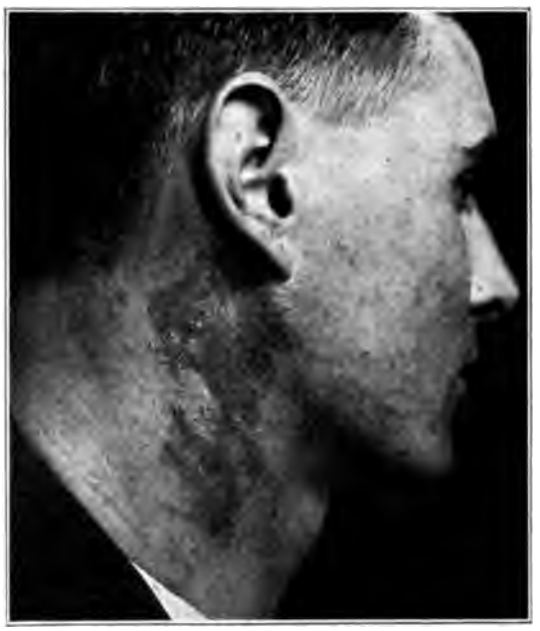

Fig. 437.—Hutchinson's infective nævus. Case mentioned in text.

Prognosis.—Vascular nævi occasionally disappear spontaneously, as in Bechet's case, but are usually permanent. Ulceration or rupture may be followed by serious hemorrhage. Both the deeply seated and the very extensive growths are difficult to eradicate, and the prognosis should be guarded.

Treatment.—In infants and in young children, superficial lesions can sometimes be obliterated by means of pressure from either a pad or by repeated painting with equal parts of collodion and flexible collodion. If the latter method is employed, a thin coating of the material should be kept on for several weeks. The electric needle

often serves admirably for the eradication of the capillary growths, if they are not too deeply seated. Cauterization with phenol or with nitric acid gives results inferior to those obtained by the needle, and the employment of powerful mineral caustics is occasionally followed by extensive scarring and keloid formation. The actual cautery, particularly Unna's "microbrenner," may occasionally be employed with success. If the lesions are not too deeply seated or too ex-

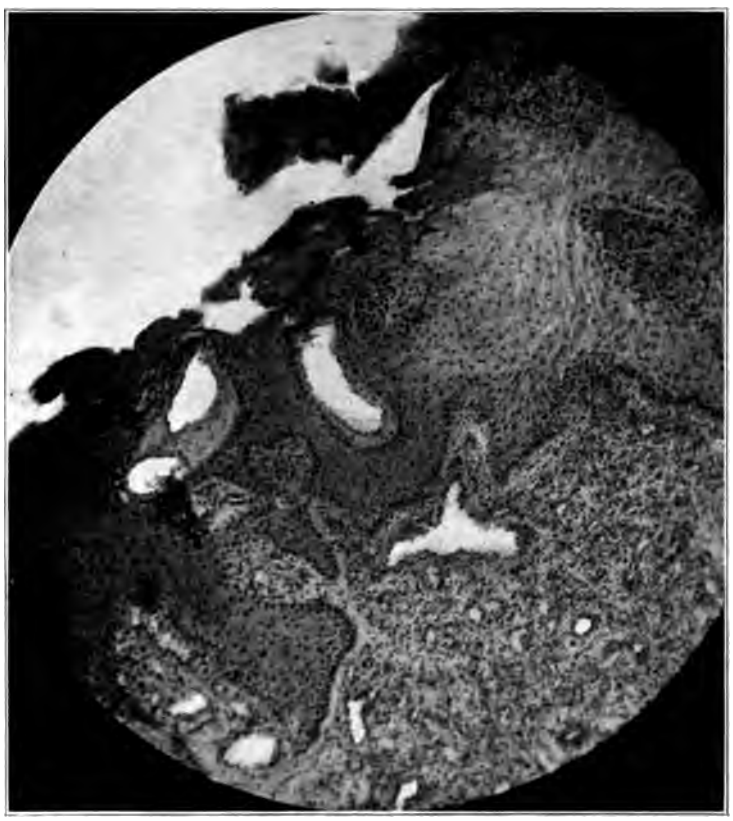

Fig. 438. — Angioma of heel. Moderate magnification. Dr. Thor Jager's patient.

tensive, they can generally be readily and quickly destroyed by means of solid carbon dioxide, as first suggested by Pusey. Liquid air is equally effective, but is hard to manage, and difficult to obtain.

In deeply seated nævi resort must usually be had to surgery. Occasionally the long continued, but cautious, use of the x-rays is followed by flattening and blanching of the tumor. Sonntag has recently

suggested the insertion of small magnesium spikes in the treatment of cutaneous angiomata. The spikes set up an inflammatory reaction, with

Fig. 439.—Nævus anemicus. (Courtesy of Dr. Frederick G. Harris.)

the ensuing formation of fibrous bands. My friend, Dr. J. W. Perkins, to whom I am indebted for this reference, has employed the method

with excellent results in several instances. He uses elongated V-shaped particles cut from a strip of photographer's magnesium tape, with barbed edges to prevent premature expulsion from the tissues. Absorption occurs in about one week. W. L. Clark and others have recently reported admirable results following the use of the Kromayer lamp. A compressor (of quartz glass) is employed in order to render the lesion anemic. Simpson, Wickham, Bathurst, and others report pleasing results following the use of radium in nævi of the "port-wine mark" variety and nearly every case can at least be benefited by its use.

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NÆVUS ANEMICUS.

Vörner, Nanta and Lavau, J. E. Lane and others have described a type of congenital nævus which is characterized by vitiligo-like areas, occurring singly or in groups, and which differ from normal skin only in vascularity. The lesions are generally somewhat rounded and their borders are sharply outlined and somewhat irregular. The surrounding skin is usually normal. The spots are made more prominent by friction, by heat or cold, and by light cupping. The hair follicles and coil glands are apparently but little affected. The etiology and histopathology are uncertain. The affection differs from vitiligo in the fact that there is no lack of pigmentation in the affected areas. Harris exhibited a typical case of the disorder before the Chicago Dermatological Society in January, 1917. In this instance the application of ice to the affected part rendered the lesion easily perceptible at a considerable distance.

Under the title of chronic vasomotor spots and their significance, Tracy has described a condition, analogous to, if not identical with, nævus anemicus. He believes the lesions to be of nervous origin, and says if peripheral nerve and cord lesions are excluded, their presence always points to an organic brain lesion.

NÆVUS FOLLICULARIS KERATOSUS.

C. J. White[1] has described a circumscribed deformity of the skin characterized by dilatation and infiltration of the follicles which

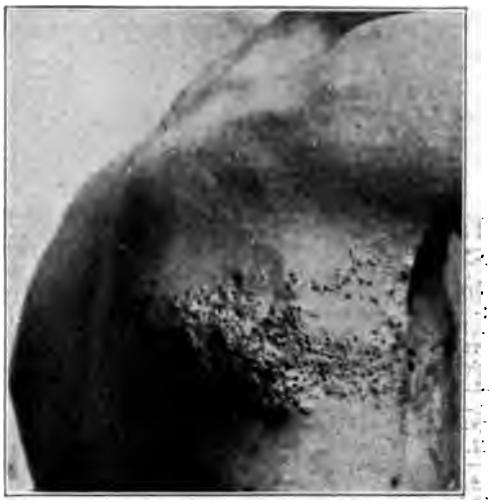

Fig. 440.—Nævus follicularis keratosus. (Courtesy of Dr. Charles J. White.)

Fig. 441.—Nævus follicularis keratosus. Showing large, cone-shaped keratinous plugs above, and wide, dense masses of inflammatory cells in derma. (Courtesy of Dr. Charles J. White.)

were widely dilated, and crateriform and sieve-like in appearance. The patient was a man, aged 24, and the lesion, which was band-

[1] *C. J. White*, Jour. Cutan. Dis., 1914, p. 187.

like, and involved the right thorax, from the lower angle of the scapula to the nipple, varied from 3 cm. to 5 cm. in width, and had been present fourteen years. It gave rise to no subjective symptoms, and the patient stated that the diseased area seemed to be gradually spreading. Histologically, White found "deep, truncate, tubular or irregularly shaped invaginations, dipping deeply into the corium and plugged with fasciculated basic-staining tissue, while the great body of the corium was filled with relatively enormous, circular, oval or triangular cavities, containing apparently similar nuclear-tinted material." The coil glands and ducts were numerous, but inconspicuous, and, save for moderate inflammatory infil-

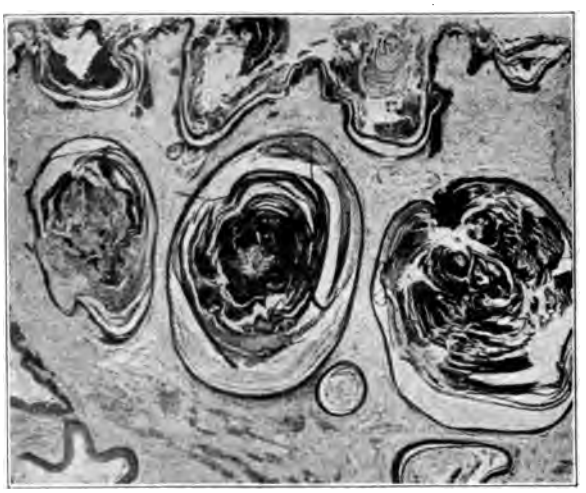

Fig. 442.—Nævus follicularis keratosus. Showing large U-shaped follicular openings filled with horny detritus, and cysts filled with lamellated epithelium. (Courtesy of Dr. Charles J. White.)

tration, it could be definitely proved that the sebaceous glands played no rôle in the process. Selhorst and Thibierge have each described congenital acneiform conditions occurring in young women, and characterized by comedones and multiple scarring resulting from pyogenic infection of the grease-filled, dilated follicles. Both Selhorst's "nævus acneiformis unilateralis" and Thibierge's "nævus acneique unilateral en bandes et en plaques" materially differed, both clinically and histologically, from White's case. Under the title of "Folliculitis Ulerythematosa Reticulata" (q. v.), MacKee and Parounagian have recently described a condition which histologically resembles White's disease.

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Fig. 443.—Follicularis ulerythematosa reticularis. (Courtesy of Dr. Geo. M. MacKee.)

FOLLICULITIS ULERYTHEMATOSA RETICULATA.

Under the designation of "folliculitis ulerythematosa reticulata," MacKee and Parounagian have described two cases of a chronic disease of the skin in which the eruption was limited to and symmetrically dis-

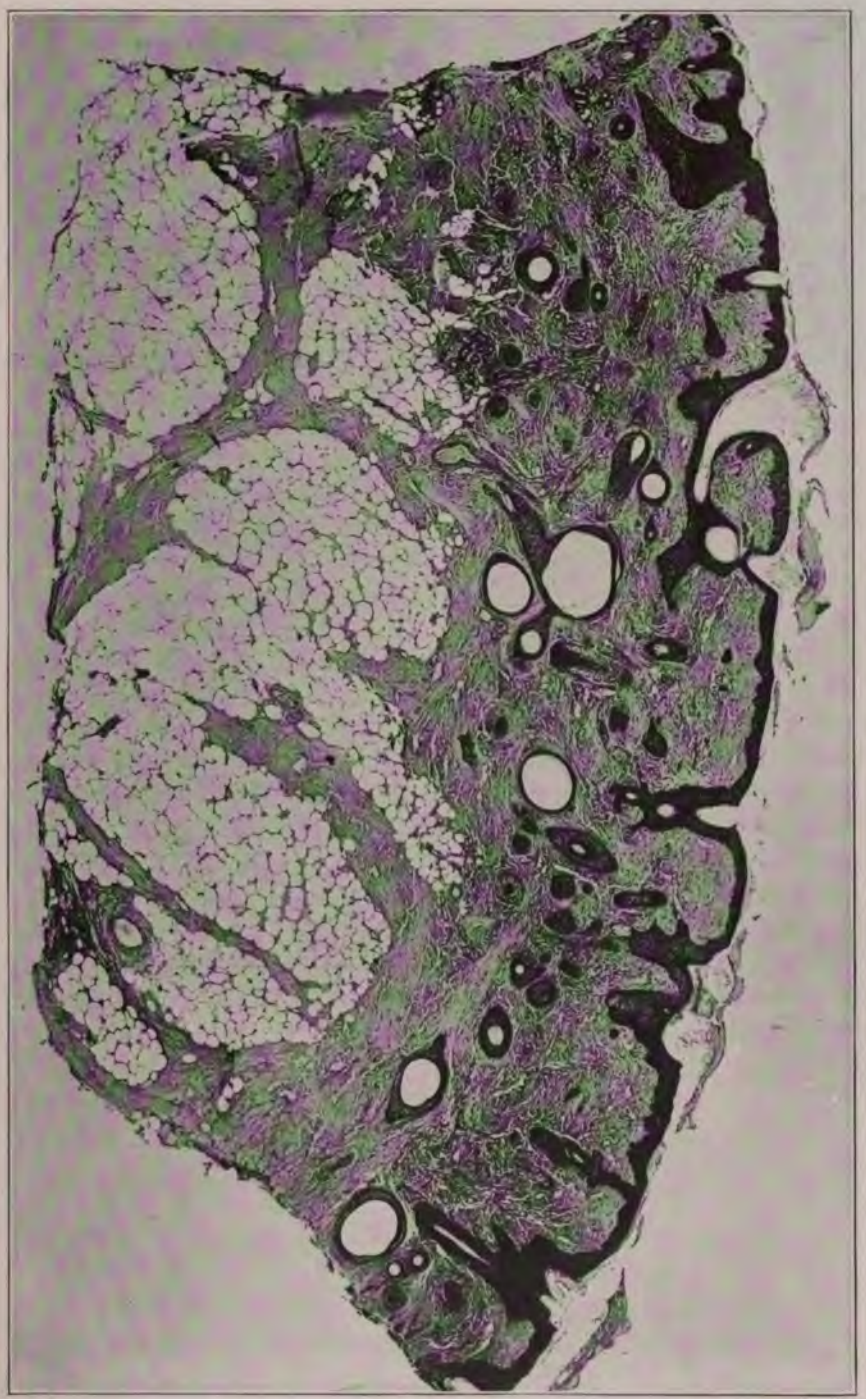

Fig. 444.—Follicularis ulerythematosa reticulata. Moderate magnification. (Courtesy of Dr. Geo. M. MacKee.)

tributed over the greater part of both cheeks. One of the patients was a Jewish girl of sixteen, the other a Jewish boy of nine. In the former, the lesions had been present for eight years; in the latter, three years.

The eruption consisted of numerous closely crowded, small areas of atrophy separated by narrow ridges. This produced a reticulated, honeycomb, or network, appearance. The individual atrophic areas were pit-like, very abrupt, about 1 mm. in depth and ranged from ¼ to 2 sq. mm. In places, two or more depressions had united to form areas perhaps 3 sq. mm., or even larger. There were a few small comedones, both in the depressed areas and in the ridges. A number of milium bodies were noted in the ridges. The skin covering the narrow partitions or ridges was on a level with that covering the unaffected portion of the face; and, on close inspection, looked waxy and stretched. It also seemed more resistant—harder—than the normal skin. The entire affected area was irregularly erythematous.

Histologically, they found a slightly atrophic epidermis with loss of rete plugs. Inflammation in the derma was manifested by vascular and lymphatic dilatation, congestion, edema, and perivascular and perifollicular infiltration of small round cells. Degenerative changes in the connective tissue ending in atrophy and retraction. Underdevelopment of the sebaceous glands and a marked overdevelopment of the hair follicles. Horny cysts derived from the hair follicles scattered throughout the cutis, some of which were connected to the hair follicles by a slender epithelial bridge, or completely isolated.

The cause of the disease is unknown. MacKee and Parounagian review the various case reports that have appeared in the literature of conditions which might represent or simulate the one under discussion. Histologically, it has much in common with White's "Nævus Follicularis Keratosis," but the clinical histories of the two conditions vary widely.

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TELANGIECTASIS.

Telangiectases, or acquired vascular dilatations, are usually localized, but may be of general distribution, as in the cases reported by Frick and by Stokes. In the vast majority of instances they result from the enlargement of pre-existing vascular channels, but it is probable that

in some instances new vessels develop. Telangiectases are symptomatic manifestations in rosacea, angiokeratoma, morphea, Röntgen dermatitis, and xeroderma pigmentosum, but occasionally they may develop without appreciable cause. The sites of predilection are the flush areas of the face, and the lateral surfaces of the nose. As a rule, they are abbreviated and tortuous, level with the general surface of the skin, or elevated slightly above it, and bright red in color.

Nævus araneus, or *spider nævus,* is a comparatively common type of vascular dilatation consisting of a central tumor of minute size with numerous capillary radiations. The little growths are usually soli-

Fig. 445.—Telangiectases of skin. Low magnification. (Dr. William Frick's case.)

tary or few in number, but Crocker, Mandelbaum and others have reported instances in which they were very numerous, and involved the face, trunk and limbs. Multiple telangiectatic areas on the face and body have been noted occurring in several members of one family by Ormsby. Generalized telangiectasia in association with syphilis has been ably investigated by Stokes. Papillary varices are pinhead- to pea-sized, soft or semisolid, slightly compressible, rounded, vascular tumors which develop on the trunk in middle aged or elderly individuals. They may be filled with uncoagulated blood, but sometimes contain thrombi.

Etiology and Pathology.—In Frick's patient, who committed sui-

cide, W. K. Trimble found the liver very much enlarged, extending from the umbilicus to the crest of the ilium, and upward to the sixth intercostal space. There were numerous small, firm tumors, from the size of a pea to that of a walnut, distributed irregularly over the surface. One large nodule, about the size of a walnut, was observed in the mesentery of the small bowel, within 18 inches of the ileocecal valve. The serous covering of the bowel throughout showed marked enlargement of the capillary blood vessels. The mucous membrane of the stomach indicated the existence of a former gastritis. The pancreas was normal, but the spleen was about three times its usual size and dark red in color. Both kidneys were enlarged and congested, and showed dilated capillaries throughout. The adrenals were apparently normal. The pleura presented the same condition of dilated capillaries as that observed on the surface of the intestines. Microscopic examination of the hepatic tumors showed them to be carcinomatous in origin. Sections of the affected skin exhibited only dilatation of the capillaries, with no blood outside the vessel walls. Frick believed the telangiectasis to be due to pressure on the sympathetic nerve in this region.

Treatment.—The lesions may be destroyed by means of the electric needle, with carbon dioxide snow, or by multiple linear scarification.

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FIBROMA.

Synonyms.—Molluscum fibrosum; Molluscum simplex; Molluscum pendulum; Acrochordon; Neurofibroma (some cases).

Definition.—A connective tissue new-growth developing in and beneath the skin and characterized by the formation of one or more sessile, pedunculated or flattened, painless tumors.

Symptoms.—The lesions may be present at birth, but usually appear later in life, particularly at or about the age of puberty. Occasionally the growths may be single, pendulous, and very large, but as a rule, they are multiple, numbering from three or four up to several hundred. In size they vary from that of a small pea to that of a turkey egg. They are usually rounded or oval, with a narrow and somewhat elongated neck, but they may be pear- or sausage-shaped, or even lobulated. In their earlier stages, and in some in-

stances throughout their course, elevation is slight or almost entirely wanting, and the tumors are more apparent to the touch than to the sight. In consistency they are generally soft or semisolid, but may be quite hard and firm. The trunk is a favored site for the lesions. The face and limbs are frequently affected, but the mouth, the rec-

Fig. 446.—Molluscum fibrosum which developed following removal of ovarian cyst on right side. Lesions confined to abdomen and right lower limb. (Courtesy of Dr. B. L. Sulzbacher.)

tum, in fact the entire intestinal tract, and even the bones, may be involved. In the majority of instances the skin covering the tumors is pinkish in color, lax and soft, but in rare instances, and particularly if the tumors are developing very rapidly, inflammation and ulceration, and even gangrene may supervene. The broad, lax, pen-

dulous tumors which sometimes occur in this disease appear to consist mainly of flat and thickened skin, and generally involve the

Fig. 447.—Molluscum fibrosum. The tumors are smaller than usual.

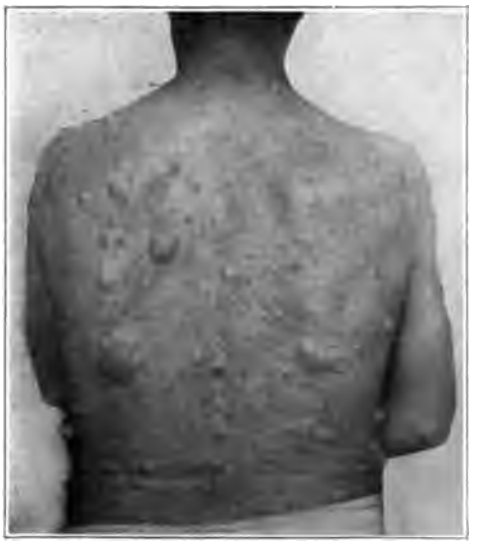

Fig. 448.—Molluscum fibrosum.

face (as in Alibert's case), the arms, axillae, buttocks and thighs. Crocker would separate these examples of fibroma pendulum from dermatolysis (q.v.), which he believes should be restricted to the

congenital cases presenting loose attachment of the skin without hypertrophy. In some of the generalized types a few or all of the tumors may be neurofibromata (von Recklinghausen's disease), and in these cases light or dark brown freckling and pigmentation are fairly characteristic, but not a pathognomonic, accompaniment. The

Fig. 449.—Molluscum fibrosum. (Courtesy of Drs. Hissem and O'Donnell, Ellsworth, Kansas.)

pigmentation may precede or accompany the tumor formation. Hebra, Pringle, Ormsby, and others have called attention to the low standard of physical and mental development in many of the subjects of this disease. Adenoma sebaceum is a not infrequent concomitant affection, and it is extremely probable that in many instances heredity plays an important part.

Molluscum Fibrosum Gravidarum.—In 1906 Brickner reported a

peculiar variety of fibroma in which the lesions developed during the later months of pregnancy, and partially or completely disappeared shortly following childbirth. The tumors were pinhead- to pea-sized, pedunculated, and were almost entirely confined to the mammary region. Hirst has described an example of the disorder, and Brickner has reported a second series of cases. I have seen two instances of the disease, both in young white women of more than average intelligence. Histologically, the lesions cannot be differentiated from those of molluscum simplex.

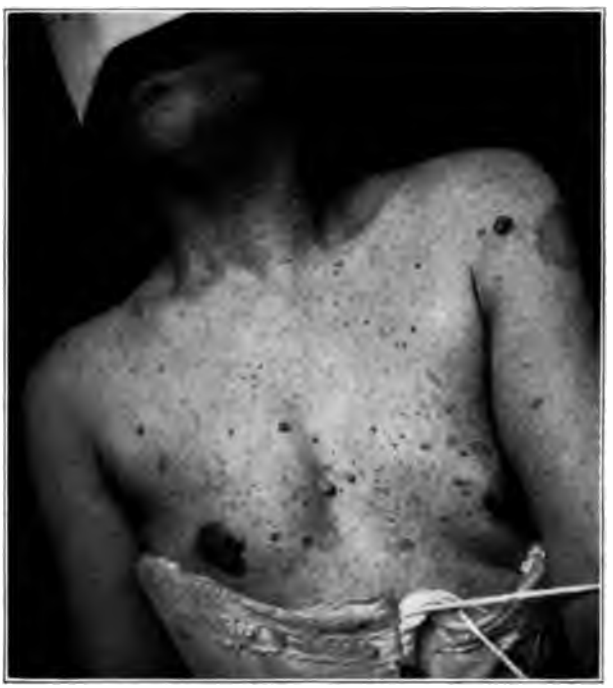

Fig. 450.—Molluscum fibrosum gravidarum.

Hard fibromata, or *dermoids*, are small, hard, sharply defined tumors which occur on the trunk and extremities of both sexes and at all ages. Clinically they somewhat resemble the firmer types of ordinary molluscum, but they develop very slowly, and usually are comparatively few in number.

Etiology.—The cause of fibroma is unknown. The course of the lesions in fibroma molluscum gravidarum would indicate that certain constitutional states (such as the presence of a specific hormone)

may bear some etiologic relationship. Virchow, Trimble, and others have noted a family tendency to the affection, and the frequent association of the disorder with developmental defects of various kinds is suggestive.

Pathology.—The histopathology of molluscum fibrosum is still a debated question. Von Recklinghausen holds that the majority, if not all, of the lesions are neurofibromata, and that they spring pri-

Fig. 451.—Molluscum fibrosum. Low magnification.

marily from the connective tissue sheaths of the nerves, afterward spreading upward along the nerves, the vessels, and the coil glands and follicles. Kriege and, later, Unna, confirmed von Recklinghausen's findings. Unna states that the subcutaneous nodules show a distinct plexiform arrangement, and consist of cords of finely fibrillated, transparent, cellular connective tissue, held together by ordinary loose connective tissue. Medullated and non-medullated nerve fibers run through them, rarely united, usually widely separated from each other. By the growth of the inner coats the outer layers of

the nerve sheath are enormously dilated. According to this authority, the most striking constituent of the tumors is a peculiar variety of mast cell which is quite regularly distributed through the new formation. Many of the mast cells present are indistinguishable from those of the ordinary type, but a few are surrounded by a large red halo, about double the size of an ordinary mast cell. This halo shows the same red color as the granules, but instead of consisting of gran-

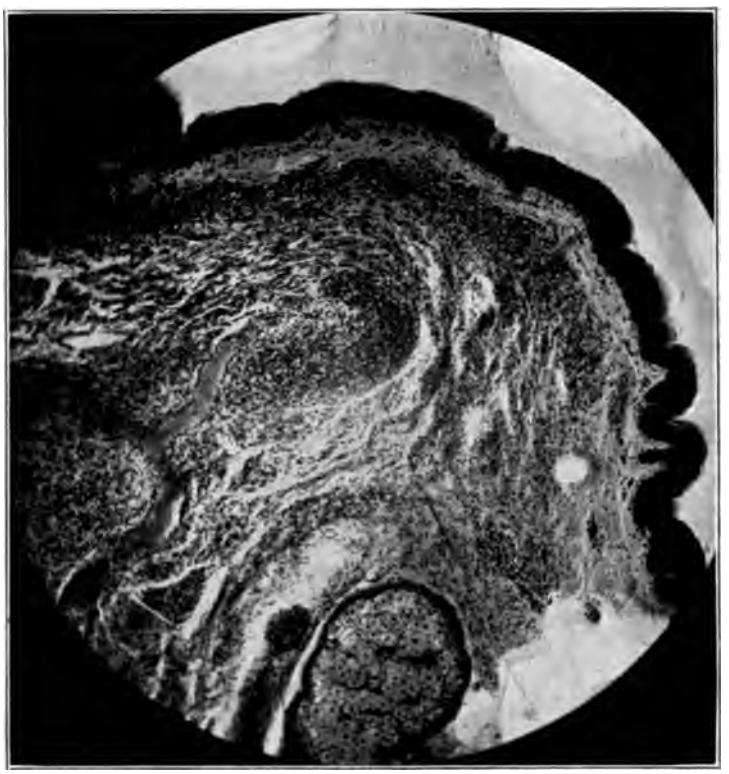

Fig. 452.—Molluscum fibrosum gravidarum. Low magnification.

ular material, it is composed of spongioplasm. Virchow, Duhring, Crocker, and a number of other authorities believe the tumors to be a result of connective tissue hyperplasia.

Diagnosis.—The growths are to be differentiated from lipomata (which are lobulated, springy to the touch, and seldom pedunculated), neuromata (which are generally of localized distribution, and are more or less painful), multiple carcinomata, sebaceous cysts, and soft, warty moles.

Prognosis.—The growths never undergo malignant changes or otherwise threaten the life of the patient. Spontaneous regression may occur, but is unusual.

Treatment.—Whitehouse and Parounagian have reported recoveries following the administration of arsenic, and the drug may be tried in extensive cases of the disease. The smaller lesions may be clipped off with scissors, or removed by means of the electric needle. The large tumors may be excised.

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MOLLUSCUM FIBROSUM GRAVIDARUM.—*Brickner,* Am. Jour. Obst., 1906, lii, p. 191. — *Hirst,* Am. Jour. Obst., 1911, lxiii, p. 256. — *Sutton,* Am. Jour. Med. Sc., 1914, N. S., cxlvii, p. 419.

PARAFFINOMA.

The term "paraffinoma" has been suggested for the growths which sometimes develop following injections of paraffin beneath the skin for cosmetic purposes. The substance is often used by so-called "beauty specialists" for the purpose of eradicating wrinkles, changing the contour of noses, and forming dimples. Tumors develop in a fairly large percentage of the cases thus treated, but a considerable period of time (from six months to five years) generally elapses between the date of injection and the development of the growths. The lesions are rounded or oval in outline and of firm consistence. In color they vary from yellowish to reddish or purplish. The surface is smooth and glossy, and occasionally marked by a few dilated capillaries. Aside from the discomfort which results from pressure, subjective symptoms are practically absent. The deformity to which the presence of the growths may give rise is sometimes very great, however, occasionally so much so as to lead the affected individual to commit suicide.

Pathology.—Heidingsfeld found the epidermis to be practically normal. The affected area was encapsulated in a wall of fibro-connective tissue. Near the center was usually one, sometimes several large cavernous spaces, which were surrounded in satellite form by innumerable smaller round cavities of similar character, giving the area a sort of honeycomb appearance, not unlike that presented by a well aërated piece of Swiss cheese. The remainder of the mass re-

sembled in its general appearance a granuloma, much like that of an early acute tuberculous lesion before caseation has taken place. This resemblance was intensified by the presence of numerous small groups of giant cells. Some of the smaller cavities were partially obliterated with a fibrin-like deposit, and the inflammatory infiltration was most marked and active in the immediate neighborhood of the large and small cavernous spaces. The surrounding tissues shared strong-

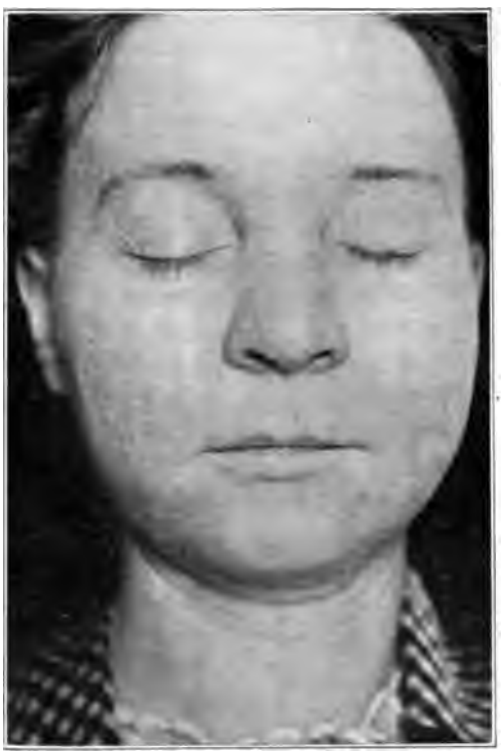

Fig. 453.—Paraffinomata of forehead and cheeks.

ly in the general inflammatory reaction, and the blood vessels showed distended lumina, and thickened walls. Other glandular elements and structures were not in evidence in the proximal tissue of the prothesis; there were areas of large, deeply stained, conglomerate cells, corresponding probably to the original distribution of the sudoriperous glands, and bearing a strong suggestion of malignant change. Ormsby found connective tissue new-growth, with giant cell formation and numerous large oval and circular spaces. The results

of my own investigations (in three cases of the disorder) coincide with those of Heidingsfeld and of Ormsby. The disappearance of the paraffin from the tissues is probably a result of phagocytic action.

Diagnosis.—The tumors are to be differentiated from fibromata and from keloids. Their location, conformation, color, shape and history should suffice for recognition.

Prognosis.—The lesions progress up to a certain point and then remain stationary. Malignant changes do not occur. Aside from the deformity, the growths are harmless.

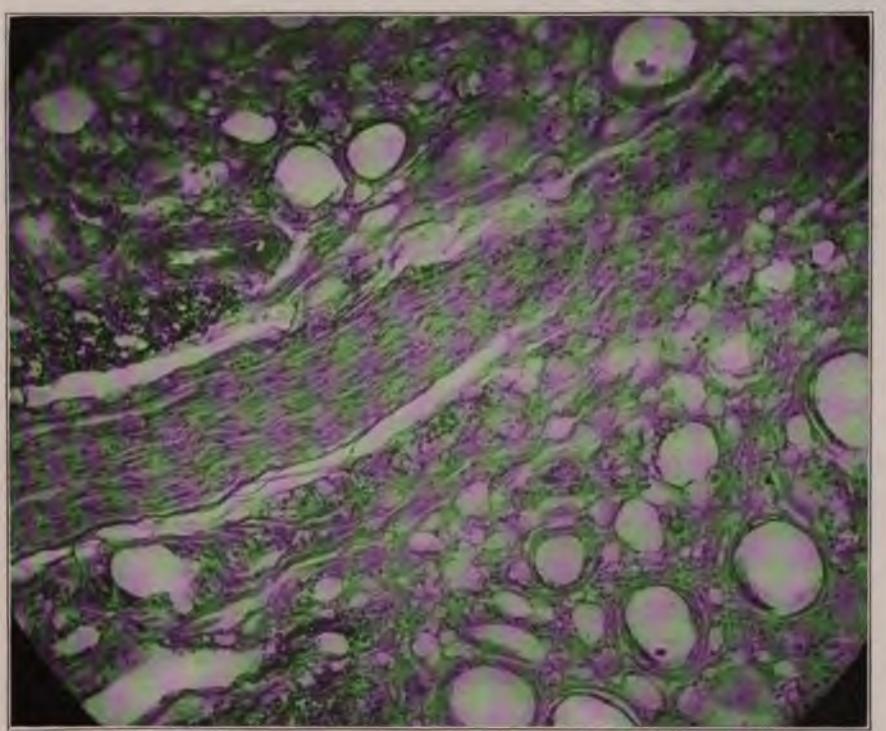

Fig 454.—Section of tumor developing after the injection of paraffin. Note Swiss cheese-like character of specimen.

Treatment.—The only satisfactory plan of treatment is total excision. Williams tried eosin and sunlight, and suggested the use of the x-rays, but in my hands the latter agent failed to benefit the condition.

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MYOMA.

Synonyms.—Muscle tumor; Leiomyoma.

Definition.—A cutaneous tumor composed of non-striated muscle fibers.

Symptoms.—Of the various classifications proposed, that of Victor Babès is probably the best and most scientific, although Besnier's division, in which the growths are separated into two general classes, simple myomata and dartoic myomata, has been widely adopted. Crocker, also, would recognize only two varieties, superficial and deep. Neumann's suggestion that the various types be grouped, pathologically, under true myomas and cavernous myomas has not met general acceptance.

Babès would distinguish:

I. Myomata springing from the vessel wall by proliferation of the muscular elements (angiomyoma cutis). These growths are usually circumscribed, solitary and deeply seated. In relation to the nerves they sometimes form irritable tumors (ganglion dolorosum myomatosum).

II. Hyperplasias of the arrectores pilorum:

1. As portions of vascular nævi (Virchow).
2. Forming multiple tumors.

III. Neoplasma derived from the deep muscular layers of the skin (myoma dartique of Besnier):

1. Diffuse, as forms of elephantiasis lymphangiectoides and pachydermis myxomatodes.
2. Circumscribed. These may be polypoid, telangiectatic or multiple, and in the last case are painful.

The so-called dartoic tumors are seen more frequently by the surgeon than by the dermatologist, and properly belong to the domain of surgery. Although myomata developing from the muscular coats of the corial blood vessels are of very great interest, both clinically and pathologically, they are exceedingly rare, only thirty instances having been recorded since Verneuil first described the condition in 1858. This is excluding the two cases reported by Wolters, which were, as Crocker has stated, very probably examples of xanthoma tuberosum multiplex and xanthoma diabeticorum, respectively.

It would appear that the condition is more common, or has oftener been recognized, in London than in any other city, examples having been recorded by Crocker, Pringle, Morris and Dore, Little and Mac-

leod. Other English cases have been reported by Leslie Roberts, of Liverpool, and Wallace Beatty, of Dublin.

On the Continent, France, Germany, Russia, and Italy are represented,—Verneuil, Besnier, Arnozan and Vaillard, Briggidi and Marcacci, Hess, Jadassohn, Nobl, Huedachinsky, Fritz, Neumann, Brolemann, Jarisch, Marschalko, Lukasiewicz, Krzvsztalowicz and Sobotka having contributed to our knowledge of the affection.

In America, Hardaway, Herzog, Charles J. White, and Heidingsfeld have reported examples of the condition.

The average age of the patients was thirty-four and one-half years. The sexes were equally affected. In 55 per cent of the cases the limbs were involved, in 40 per cent the face, and in 30 per cent the trunk. More than half of the patients suffered from paroxysmal attacks of pain in the affected region, while in 15 per cent of the cases the tumors were painful only on pressure. Fifty per cent of the growths were believed to have originated in the arrector pili muscles, and 16 percent. in the muscular coats of the blood vessels. In only one instance, the patient being Jadassohn's, did any of the tumors disappear spontaneously. The superficial growths gave rise to little or no discomfort, as a rule, but the more deeply situated ones were painful (probably, in a measure, the result of pressure).

Clinically, the individual lesions varied in size from a pinhead to an English walnut. The superficial growths in some instances were grouped to form irregular patches, the number of tumors in each collection varying from two or three to 100 or more, and bearing considerable resemblance to fibromas. In cases presenting more than a single group of lesions, the arrangement was asymmetrical, and the distribution of the tumors appeared to bear no relation to Heitzmann's lines of cleavage, although, in some instances, as in Beatty's case, the eruption appeared to be confined to certain nerve areas. The more deeply situated tumors were usually single, and round or oval in shape. The overlying skin was unbroken and apparently normal. The color of the affected areas varied from chamois to dark red. The tumors were of firm consistence, and exhibited no tendency to break down or give rise to adenopathy. They developed slowly, were always benign and never became adherent to subcutaneous structures. The peculiar paroxysmal pains, which were present in a very considerable percentage of the cases, seldom developed before the growths had attained the size of a pea. Hardaway's case was an exception to this, however, pain preceding the appearance of the tumors.

Etiology and Pathology.—The cause of myoma is not known. Histologically, the tumors consist of smooth, spindle-shaped, nucleated muscle fibers, aggregated into narrow bundles and running in various directions in a more or less abundant connective tissue stroma (Hektoen and Riesmann). The fibers contain the characteristic rod-shaped nuclei with rounded extremities, imbedded in a matrix of finely fibrillated protoplasm, with no distinct line of demarcation between the cells (Heidingsfeld).

Diagnosis.—The lesions may be confused with those of fibroma, neurofibroma, lymphangioma, and even xanthoma tuberosum, but a microscopic examination of biopsied material should suffice for recognition.

Prognosis.—The growths are benign, but do not tend to regress spontaneously.

Treatment.—Excision constitutes the only reliable method of geting rid of the tumors.

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MYOMA.—*Crocker*, Brit. Jour. Dermat., 1897, pp. 1 and 47. — *Herzog*, Jour. Cutan. Dis., 1898, p. 527. — *Chas. J. White*, Jour. Cutan. Dis., 1899, p. 266. — *Hardaway*, Jour. Cutan. Dis., 1904, p. 375. — *Hektoen and Riesmann*, American Text Book of Path., Phila., 1902, p. 182. — *Heidingsfeld*, Jour. A. M. A., 1907, xlii, p. 562. — *Sutton*, Jour. A. M. A., 1912, lix, p. 178.

NEUROMA.

Synonym.—Nerve tumor.

Definition.—A new growth originating in the neurolemma and consisting of elastic fibrous tissue and non-medullated nerve fibers.

Symptoms.—The disorder is an extremely rare one, less than a half dozen authentic examples having been recorded up to the present. The lesions are discrete, sharply defined, pea-sized tumors which are firm and elastic to the touch. After existing for many months or years they generally become sensitive and more or less painful, and occasionally they are the seat of violent pain of a paroxysmal character. The majority of the patients have been middle aged or elderly men. The lesions are irregularly distributed over the shoulders, arms and thighs. They are pinkish or reddish in color, and firmly embedded in the derma.

Etiology and Pathology.—The essential cause of neuroma is unknown. Histologically the tumors are composed of elastic and connective tissue, intermixed with non-medullated nerve fibers which lie parallel with one another.

Diagnosis.—The lesions are to be differentiated from leiomyomata and fibromata (both of which are painless).

Prognosis.—The tumors do not tend to disappear spontaneously, and they often give rise to severe and even violent paroxysmal pain.

Treatment.—The treatment is essentially surgical, and consists of the removal of the tumors or excision of a portion of the trunk of the nerve which supplies the affected area.

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NEUROMA.—*Duhring*, Am. Jour. Med. Sc., 1873, lxvi, N. S., p. 413; Idem, Ibid., 1881, lxxxii, N. S., p. 435. — *Heidingsfeld*, Jour. A. M. A., 1913, lx, p. 405.

CHONDRO-DERMATITIS NODULARIS CHRONICA HELICIS.

Under the title of "Chondro-Dermatitis Nodularis Chronica Helicis," Winkler has described a small, nodular, painful growth occurring on the rim of the ear. Foerster has recently reported four typical examples of the disorder. I have seen two cases; and Markley, of Denver, has communicated to me the histories of two more,—all apparently of the same character.

As Foerster has said, the growths appear suddenly, and without history of previous injury. They are single, ovoid, well-defined, reddish nodules, varying from 3 to 4 mm. in their longer diameter, imbedded in the skin, and, usually, unattached to the underlying cartilage. The nodule is flat-topped, or slightly convex, with a sloping margin, and has a shallow depression filled with an adherent scale. After reaching a certain size, the little tumors cease to enlarge, and remain unchanged for periods of years or decades. There is no tendency to malignancy.

Histologically, Foerster found a diffuse inflammatory and degenerative process of the corium, associated with considerable epithelial hypertrophy. Foerster recommends the galvano-cautery, electrolysis, or carbon-dioxide snow. Both of my cases responded favorably to radium.

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CHONDRO-DERMATITIS NODULARIS CHRONICA HELICIS.—*Winkler*, Arch. f. Dermat. u. Syph., cxxi, (orig.) p. 278. — *Foerster*, Jour. Cutan. Dis., 1918, p. 154 (the description here given is taken from this valuable paper).

LIPOMA.

Synonym.—Fatty tumor.

Definition.—A dermal and subcutaneous new-growth composed of fat cells, enclosed within a capsule of connective tissue.

Symptoms.—The tumors are spheroidal or lobulated, and vary greatly in size. Usually their bulk is no greater than that of a hazel-nut or an orange, but in rare instances they may assume enormous proportions. The growths generally consist of a number of lobules, each of which is more or less encapsulated in a fibrous envelope, the septa of which carry the nutrient vessels, but they may be infiltrative in character, with fine tongues of fatty tissue projecting outward along the blood vessels and between the muscle bundles. The increase in size is usually very gradual, but may be quite rapid. The tumors are freely movable, and seldom give rise to subjective symptoms. The sites of predilection are the neck, back and buttocks, but practically no region is exempt.

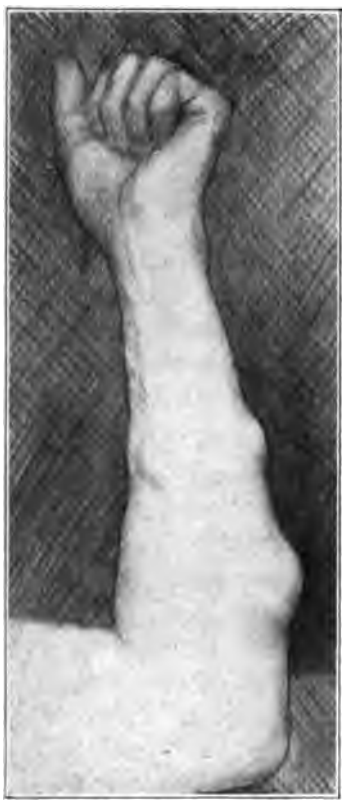

Fig. 455. Lipomata of the forearm. (Courtesy of Dr. Arthur E. Hertzler.)

Adiposis Dolorosa is a lipoma-like disorder which was first described by Dercum in 1888. The majority of reported cases have occurred in middle-aged women. The affection is characterized by irregular symmetrical deposits of fat in the subcutaneous tissue of the trunk and limbs. There is usually more or less associated neuralgic pain, and other nerve disturbances, together with muscular weakness and a tendency to hemorrhages, particularly from the mucous surfaces. The skin is often dry and harsh, and thyroid changes have been found in some of the fatal cases.

Etiology and Pathology.—The cause of the disease is unknown. The affection may be congenital, but in the majority of instances develops in middle or later life. Histologically the fat globules are characterized as opposed to normal fat, by a variation in size of the individual globules (Hertzler). The growths may undergo calcareous or other changes, but never become malignant.

Diagnosis.—The soft, slow growing, painless character of the tumors, together with their lobular outline, and the fact that they are

Fig. 456.—Diffuse lipoma. (Courtesy of Dr. Grover W. Wende.)

freely movable, are sufficient for recognition. They are to be differentiated from myomata, fibromata, and sarcomata.

Fig. 457.—Diffuse lipoma. (Courtesy of Dr. Grover W. Wende.)

Prognosis.—The growths are benign in nature, but tend to gradually increase in size.

Treatment.—Enucleation, care being taken to remove all of the fatty tissue, is the only successful plan of treatment.

REFERENCES.

LIPOMA.—*Hertzler*, Treatise on Tumors, Phila., 1912, p. 67. — *Bowen*, Am. Jour. Med. Sc., 1912, N. S., cxxi, p. 189. — *Lexer-Bevan*, Surgery, trans. from 2d German ed., 1908, New York.

ADIPOSIS DOLOROSA.—*Dercum*, University Med. Mag., Dec., 1888; Am. Jour. Med. Sc., 1892, civ, p. 521. — *Lyon*, Arch. Int. Med., 1910, vi, pp. 28 and 120.

OSTEOMA CUTIS.

Synonym.—Osteitis cutis.

True bony deposits in the skin are exceedingly rare, and their real nature is seldom recognized until the tissue is examined microscopically. The lesions may be single or multiple. Clinically they are round, oval or irregular in outline, sharply defined, and hard and resilient to the touch. In Harris' case the osteoma developed in a laparotomy scar, in Coleman's patient it occurred in the sole of the foot, and in the case reported by Heidingsfeld a pigmented nævus on the chin was the site of the growth. Pollitzer has recently reported a unique case of ossification in a case of scleroderma.

Etiology.—Both trauma and the theory of embryonal rests have been suggested as etiologic factors.

Treatment.—Excision is the only successful method of treatment, and care should be exercised to include the entire growth.

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LYMPHANGIOMA.

It is sometimes a difficult matter to separate true new-growths of the lymphatics from lymphangiectasis. Not infrequently the two processes are associated, and it is also not improbable, as Gottheil has suggested, that certain other conditions, occurring as complications or as secondary changes in lymphangioma, may so mask the true disease process as to render recognition difficult. For practical purposes the disorders of the lymphatics may be considered under the following headings:

Lymphangiectasis.—Simple dilatation, with or without vesicle formation, may involve either the superficial or the deep lymphatics. The superficial type is characterized by the presence of several or more whitish or pinkish, pinhead- to pea-sized vesicles which may be

isolated but are usually grouped, and which, when punctured, exude lymph. The lesions are soft and compressible, but their coverings are tough and elastic.

Lymphangiectasis involving the deeper vessels may be acute, but is usually chronic. It generally develops as a result of interference with the return flow of fluid, and may be followed by elephantiasis. The overlying skin may be apparently normal, or it may present

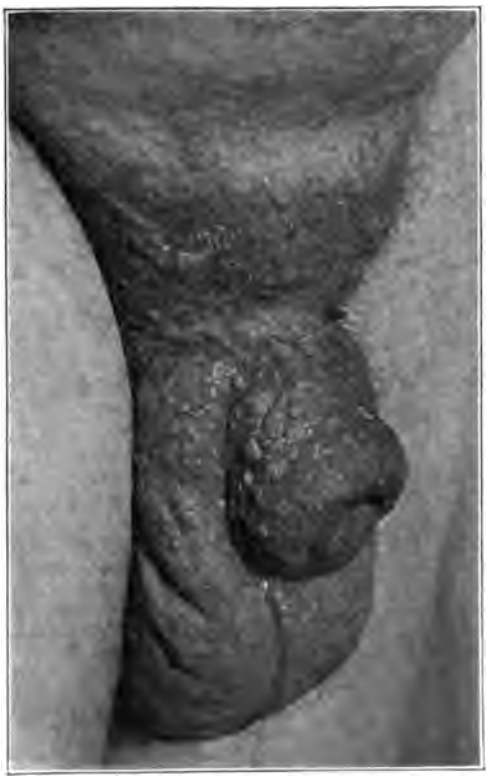

Fig. 458.—Lymphangioma circumscriptum. (Courtesy of Dr. John A. Fordyce and Dr. George M. MacKee.)

numerous soft nodules and cystic growths, or irregular, cord-like lesions. Aside from the slight increase in diameter of the part, the changes are appreciable only by palpation. In a case referred to by C. J. White, the disorder involved the anterior abdominal wall and its presence was not discovered until an incision was made during the course of a laparotomy.

Lymphangioma Simplex.—This variety is characterized by the oc-

currence of small, circumscribed, compressible tumors composed of old and newly formed lymphatic vessels filled with fluid. The lesions are whitish or pinkish in color, translucent, and sparsely and irregularly grouped over the affected areas. The sites of predilection are the lips, mouth and genitalia. There may be some associated edema and thickening of the underlying tissues, as in elephantiasis. Lymphangiomata of this type occasionally involve the tongue, giving rise to "macroglossia," or the lips, "macrocheilia." Histologically, the lesions consist of enormously hypertrophied lymphatic vessels, lined with endothelium. In a case reported by Gottheil, there was apparently a combination of a superficial lymphangioma with the degeneration of the elastic tissue characteristic of pseudoxanthoma elasticum.

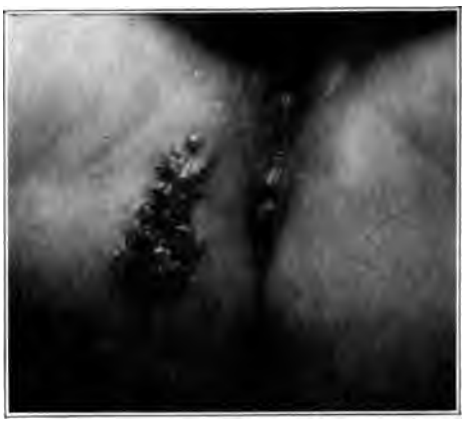

Fig. 459.—Lymphangioma circumscriptum. (Courtesy of Dr. Otto Leslie Castle.)

Gottheil believed the elastic degeneration to be a secondary change, dependent upon the obstruction to the lymphatic circulation by the lymphangiomatous tumors.

Cystic lymphangioma, or hygroma, is usually congenital in origin, and commonly affects the anterior cervical region. It is a surgical disorder.

Lymphangioma Circumscriptum (Cavernous lymphangioma; Lymphangiectodes; Lymphangioma simplex):—This affection is characterized by a localized eruption of thick-walled, pinhead- to pea-sized, opalescent, frog-spawn-like vesicles. The groups are generally few in number, from one to three, and the sites of predilection are the thighs, the upper arms, and the mucous membrane of the mouth and tongue (Francis). The axillary and scapular regions also are frequently involved (Bowen). The patches vary in size and shape

and are generally 8 to 10 cm. in diameter. The earlier lesions are small, deeply seated, opalescent vesicles (hence the very apt comparison to frog-spawn). Later, as in the case reported by J. C. White, they may become thick, rough and crusted, or even verrucose. When punctured, however, the character and amount of the exudate immediately discloses their true nature. Telangiectasis is a not infre-

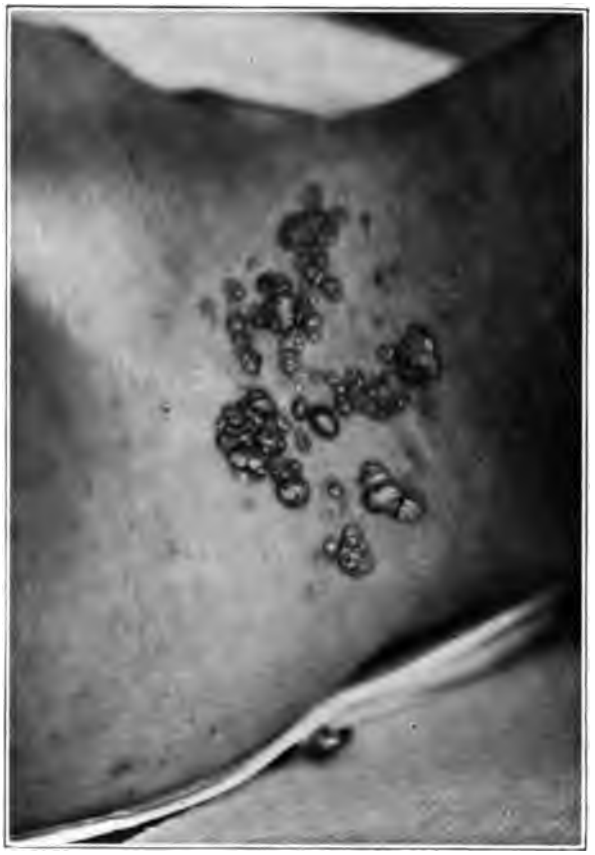

Fig. 460.—Lymphangioma circumscriptum.

quent accompaniment, and occasionally the affected area is the site of a recurring erysipelatous inflammation. The lesions develop early in life, and are usually persistent. They give rise to no subjective symptoms.

Etiology and Pathology.—The cause of lymphangioma circumscriptum is not known. The fact of its occurrence in infancy and early

childhood would indicate a congenital factor. Unna assumes the simultaneous occurrence of lymphatic and venous stasis as a preliminary to the abnormal congenital tendency to proliferation of the endo- and perithelium, and Pollitzer also is inclined to the view that a deep lying obstruction, lymphatic, or conjoint venous and lymphatic, is the first event in the chain that results in the formation of lymphangioma. Darier believes the seat of this obstruction to be in the lymphnodes. Török and other investigators hold that a new forma-

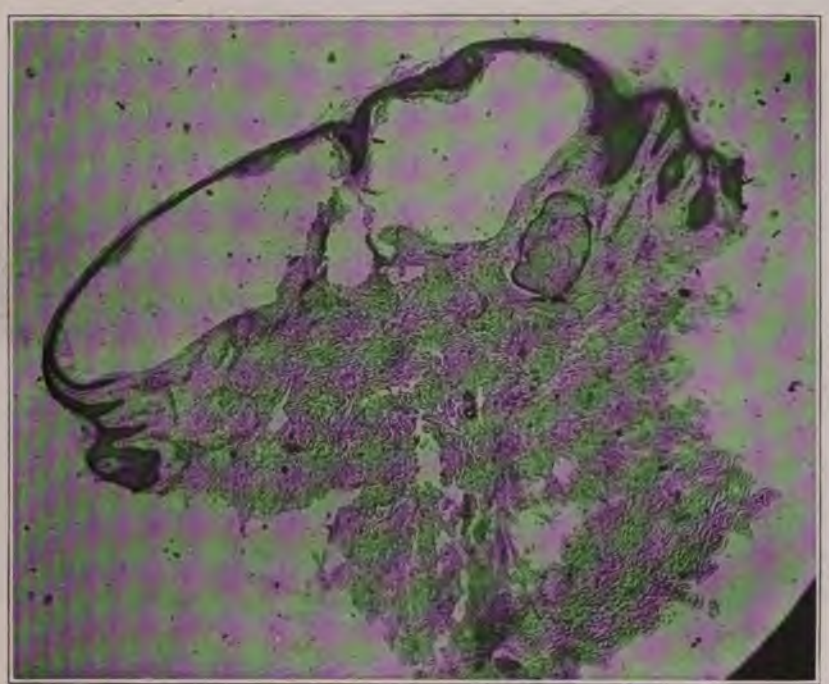

Fig. 461.—Lymphangioma circumscriptum. Low magnification.

tion of lymph vessels is the primary change, the dilatation being secondary. The vesicles, which are really round or pear-shaped cysts, are occasionally divided by septa, and are lined with endothelium. They are situated, for the most part, in the upper regions of the corium. The cavities are filled with granular matter and lymph and fibrin, and sometimes contain leucocytes, and even blood. There is some accompanying pericystic round-cell infiltration, often with dilatation and new-growth of the capillaries.

Diagnosis.—The character and distribution of the lesions is characteristic.

Prognosis.—Spontaneous regression seldom occurs, although the patches of vesicles may tend gradually to shift locations, as in the cases reported by Stelwagon and by Hartzell.

Treatment.—The best results have followed the use of radiotherapy. The lesions may also be removed by excision, electrolysis or cauterization, but following the employment of these methods the growths often recur. Simpson has recently reported an excellent result in one case of lymphangioma circumscriptum treated with radium. C. J. White likewise has had an admirable result in a case in which the tongue was involved, and in a similar case recently referred to me by Dr. Walter F. Pine, radium proved an admirable curative agent. Heavy dosage was not required and the cosmetic result was all that could be desired.

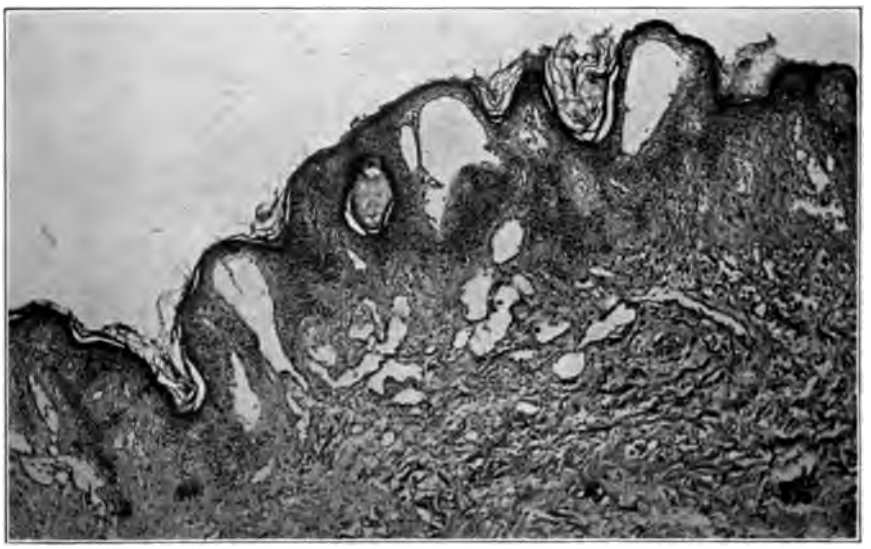

Fig. 462.—Lymphangioma circumscriptum. Low magnification. (Courtesy of Dr. W. S. Gottheil.)

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LYMPHANGIOMA.—*Bowen*, Twentieth Century Practice, v, p. 685. — *Francis*, Brit. Jour. Dermat., 1893, pp. 33 and 65. — *Elliot*, Jour. Cutan. Dis., 1894, p. 137. — *J. C. White*, Jour. Cutan. Dis., 1894, p. 474. — *Török*, Monatsh. f. prakt. Dermat., 1892, xiv, p. 169. — *A. R. Robinson*, Jour. Cutan. Dis., 1895, p. 476. — *Chas. J. White*, Jour. Cutan. Dis., 1909, p. 281. — *Gottheil*, Jour. Cutan. Dis., 1909, p. 277. — *Gilchrist*, Bull., Johns Hopkins Hosp. 1896, p. 138. — *Stelwagon*, Diseases of the Skin, Phila., 1914, p. 665. — *Hartzell*, Med. News, Jan. 16, 1892. — *Brocq and Bernard*, Ann. de dermat. et de syph., 1898, p. 305. — *Unna*, cited by Pollitzer, loc. cit. — *Frank E. Simpson*, Jour. A. M. A., 1916, lxvi, p. 949 (excellent result following use of radium).

ACANTHOMA ADENOIDES CYSTICUM.

Synonyms.—Multiple benign cystic epithelioma; Epithelioma adenoides cysticum; Tricho-epithelioma papulosum multiplex.

Definition.—An affection characterized by the occurrence of a few or several, pinhead- to pea-sized, rounded, shining, translucent nodules which exhibit a predilection for the face, scalp, neck and chest.

Fig. 463.—Acanthoma adenoides cysticum in a full-blooded negro.

Symptoms.—The lesions are pinkish, yellowish, whitish, or bluish in color, and rounded or oval in outline. Occasionally they present a slight central depression. They are of firm consistence, and give rise to no subjective symptoms. They are generally discrete, but may be closely bunched or even coalescent. Telangiectasis is a frequent accompanying feature, particularly in the larger lesions. A hereditary or family tendency is frequently noted, as in Brooke's and my own cases.

The lesions begin as tiny dark macules or as papules, and gradually

develop up to a certain point where they remain stationary. They seldom ulcerate or exhibit evidences of malignancy, although exceptions to this rule have been noted by J. C. White, Stelwagon, Jarisch, Schamberg, and Dennie and the author. On the face the distribution is often more or less symmetrical, but on other parts of the body this tendency is absent.

Etiology.—The cause of the malady is not known. Females are affected more frequently than males. The lesions commonly become apparent at or about the age of puberty. Histologically, the findings

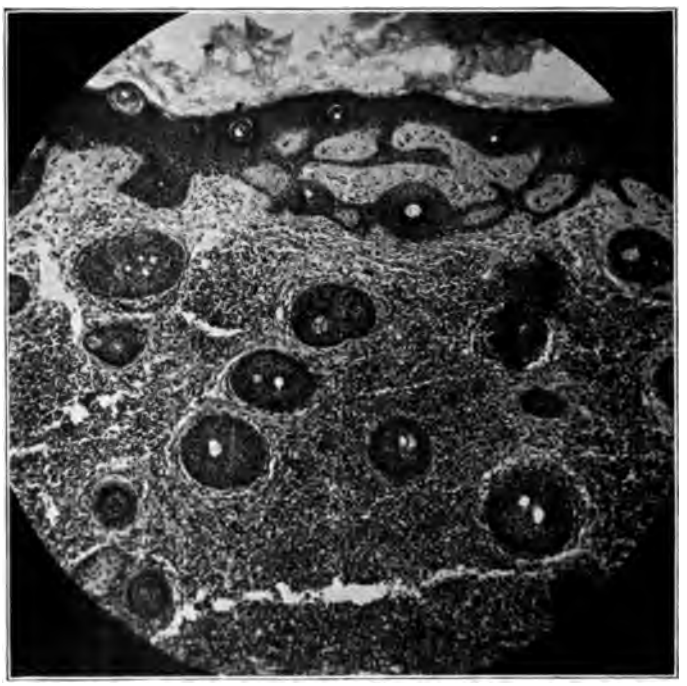

Fig. 464.—Acanthoma adenoides cysticum, showing cysts and character of intercystic epithelial strands. Low magnification.

have been practically identical in all of the representative examples that have been studied. In aberrant types, however, such as the one described by Hartzell, the structural changes are far from characteristic. In sections from two typical lesions, Dennie and I found the corium somewhat disorganized; considerable quantities of blood, and large numbers of infiltrating round cells being present. No hair follicles, or sebaceous or coil glands were found in either of the specimens. Extending downward into the cutis from the basal layer of

the epidermis were numerous long, slender chains of epithelium, two or three cells in width, which terminated in bulb-like cysts, filled with colloid substance and corneous material. Several snared off sebaceous masses, such as have been described by Csillag, were also to be seen. The chains were composed of epithelial cells which reacted to the various stains in a manner exactly similar to the apparently normal elements in the overlying epidermis. No free tracts were to be found. The outermost covering of the club-shaped projections consisted always of a layer of cylindrical epithelium—in no instance could a double row of flattened, regularly arranged cells be demonstrated—and an inner zone of imperfectly stained, rounded epithelial cells, encircling a central zone of débris.

Diagnosis.—The localization and persistence of the tumors, their development in childhood, and their frequent occurrence in several members of the same family, should serve to differentiate them from the lesions of adenoma sebaceum, syringocystadenoma, and molluscum contagiosum which they most nearly resemble.

Prognosis.—In the vast majority of instances the growths are benign in character.

Treatment.—Curettage, followed by thorough cauterization with acid nitrate of mercury, has proved a very satisfactory method in my hands. Suspicious-looking lesions should be excised. In some instances the x-rays may be advantageously employed, and excellent results should follow the use of radium.

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ADENOMA SEBACEUM.

Synonyms.—Adenoma of the sebaceous glands; Steatadenoma; Acanthoma of the sebaceous glands.

Definition.—Benign, tumor-like growths, developing from the epithelium of sebaceous glands, which may undergo fatty, but never colloid, metamorphosis.

Symptoms.—As Unna has stated, true steatadenomata are exceedingly rare. As generally accepted, however, the term "adenoma

sebaceum'' includes both true growths of the sebaceous glands and examples of circumscribed glandular hypertrophy, and with our present knowledge of the condition it is probably best to adhere to this broader conception.

Fig. 465.—Adenoma sebaceum in a negro.

Fig. 466.—Adenoma sebaceum. The white spots are the result of freezing with carbon-dioxide snow. (Courtesy of Dr. E. Wood Ruggles.)

Fig. 467.—Adenoma sebaceum. (Courtesy of Dr. J. B. Shelmire.)

Rayer was the first to describe the disease which we now recognize as adenoma sebaceum, although he called the little tumors ''végéta-

tiones vasculaires," principally because of the telangiectic condition which usually accompanies them. Addison and Gull early reported examples of the disorder, which they designated as a lichen.

The lesions vary in size from that of a pinhead to that of a split-pea, seldom coalesce, and are usually distributed in a symmetrical manner over the nose, cheeks, and nasio-labial folds. In color they

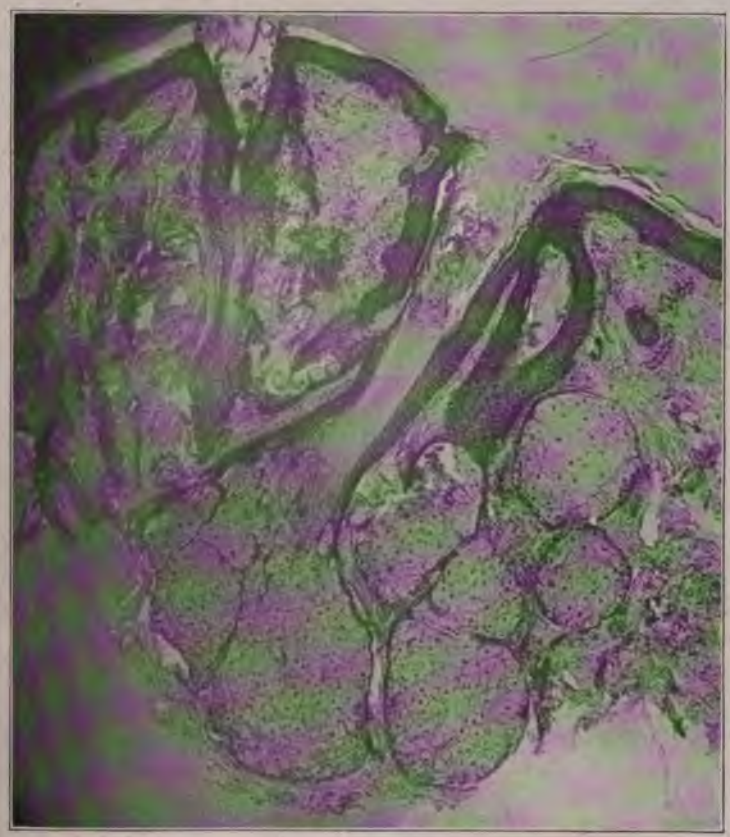

Fig. 468.—Section of a lesion of adenoma sebaceum. Low magnification.

are yellowish or pinkish, and there is generally a dilated condition of the superficial capillaries in the affected region. The growths usually appear in early childhood or at puberty. They are benign, but persist indefinitely. Persons of defective mental development are more frequently attacked than those of normal intelligence. A hereditary tendency has been noted in only a few instances. Shelmire

has recently reported the occurrence of the disorder in a family group of five.

Etiology.—Aside from the fact that the majority of the affected individuals are mentally below par, practically nothing is known regarding its causation. The disorder is probably congenital in a considerable percentage of cases.

Pathology.—Balzer and Menétrier are usually credited with having first studied the growths microscopically, but, as Unna has pointed out, what these investigators believed to be "transformed sebaceous elements" were, in reality, hyaline and colloid fragments, consequently the neoplasms were not sebaceous tumors at all, but examples of acanthoma adenoides cysticum. It is probable that Bock (1880) and Pringle (1890) were the pioneer students of the histopathology of the disorder. Histologically, the lesions may consist only of a circumscribed hypertrophy of the sebaceous glands such as occurs in rhinophyma. Occasionally, true tumor formation takes place, as in Bock's and my own cases.

Diagnosis.—The lesions are to be differentiated from those of acanthoma adenoides cysticum and of molluscum contagiosum. Their development in early life, their distribution, and in doubtful cases, the details of their structure, will prevent confusion with the first, and their history, chronicity, and the absence of a central depression and opening should exclude the second.

Prognosis and Treatment.—The tumors are harmless, but seldom if ever undergo spontaneous involution. They can be removed with the electric needle, the cutaneous punch, or the curette. In one instance I secured satisfactory results from the use of carbon dioxide snow.

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ADENOMA SEBACEUM.—*Rayer*, Rayer's Treatise, 2nd ed., Willis' transl., p. 996. — *Addison and Gull*, Guy's Hosp. Rep., London, S, ii, viii, p. 267. — *Bock*, Virchow's Arch., lxxxi, p. 503. — *Pringle*, Brit. Jour. Dermat., 1890, p. 1. — *Pollitzer*, Jour. A. M. A., 1901, xxxvi, p. 176. — *Sutton*, Jour. Cutan. Dis., 1911, p. 480 (much of the included description is taken from this article). — *Unna*, Histopathology. — *Shelmire*, Jour. A. M. A., 1918, lxxi, p. 963 (good presentation of subject, with excellent photographs. Benefit following use of carbon-dioxide snow).

SYRINGOCYSTADENOMA.

Synonyms.—Lymphangioma tuberosum multiplex; Syringocystoma; Syringoma; Hemangio-endothelioma tuberosum multiplex.

Definition.—A benign, cystic neoplasm derived from embryonal coil gland elements.

Symptoms.—This malady, which was first described under the title of "lymphangioma tuberosum multiplex," by Biesiadecki and

Kaposi, in 1872, is a rather uncommon one. The majority of reported cases have occurred in adult females. The lesions, which are yellowish or brownish in color, are slightly elevated, and soft and compressible to the touch. They develop slowly, persist indefinitely, and give rise to no subjective symptoms. The general health is unaffected. The sites of predilection are the axillae, shoulders, and chest. Occasionally as in Ormsby's and Rasoni's cases, the distribution of the tumors may be more or less general. Stokes has described an extraordinary case in which there was a combination of a nævus of the sudoriparous glands with a highly vascular granuloma.

Etiology and Pathology.—The etiology of syringocystadenoma is unknown. It is probable that the basic factors in its causation are

Fig. 469.—Syringocystadenoma, showing characteristic grouping of lesions.

congenital. Biesiadecki and Kaposi believed the disorder to be a lymphangiomatous one. While it is generally conceded that these investigators were mistaken regarding the point of origin of the growths, the designation bestowed by them has been allowed to stand, partly on account of priority, but principally because of the indefiniteness of our knowledge concerning the origin of the epithelial processes of which the tumors are largely composed. The sources from which the epithelium can be derived are limited—it must come directly from the prickle layer of the skin or hair follicle, from the coil or duct of the sweat apparatus, or from the endothelium of the blood vessels, or, theoretically, it may develop from misplaced embryonic rudiments of one or more of these structures (a, so-called,

Cohnheim's rest, or according to Ribbert's theory of mechanic isolation, from cells that accident has removed from the influence of normal cell association).

An idea of the lack of unanimity of opinion among the various investigators may be gained by a very casual survey of the literature. Almost every observer has seen fit to rename the affection, giving it a title that corresponded with his conception of the origin of the epithelial accumulations. The resulting cognomens vary from the "cel-

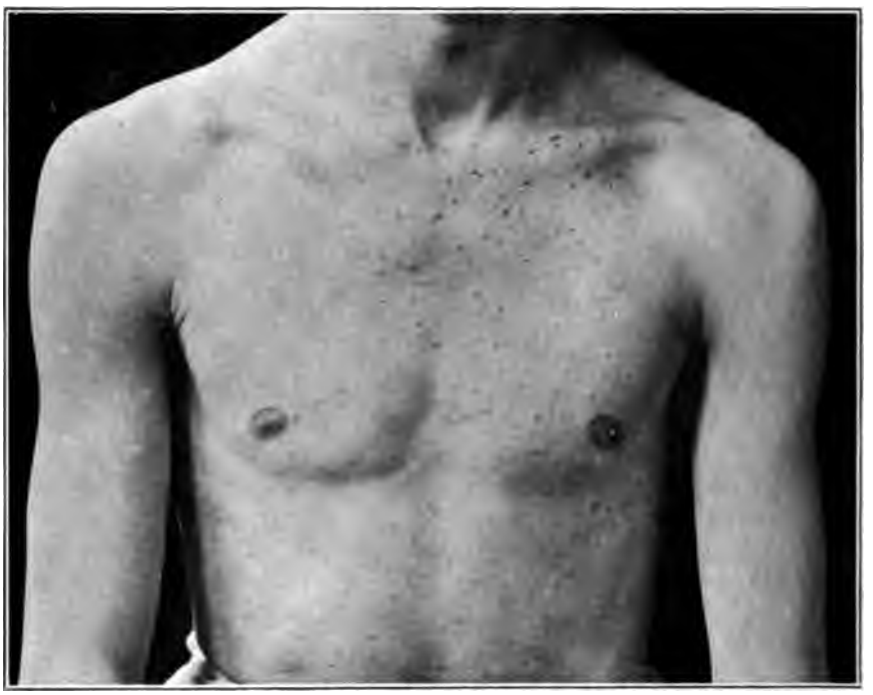

Fig. 470.—Syringocystadenoma, showing typical distribution. (Courtesy of Dr. Phillip Shaffner.)

lulome épithélial éruptif" of Quinquaud, and the "nævi cyst-epithéliaux kystiques" of Besnier to the "hæmangioendothelioma cutis papulosum" of Waldheim and the "nævi cyst-epitheliomatosi disseminata" of Gassmann.

The pathologic changes in the case studied by Dennie and the author were almost identical with those seen in Charles J. White's case—an unchanged stratum corneum, a thinned granular layer almost devoid of granules, and a rete having a basal layer regularly arranged but composed of swollen, edematous cells, the nuclei of which

were large and vesicular, and separated from the encompassing cytoplasm by a considerable space. In the majority of the specimens, the papillae were flattened or entirely absent. There was some cellular infiltration in the upper corium, but the blood vessels, which were con-

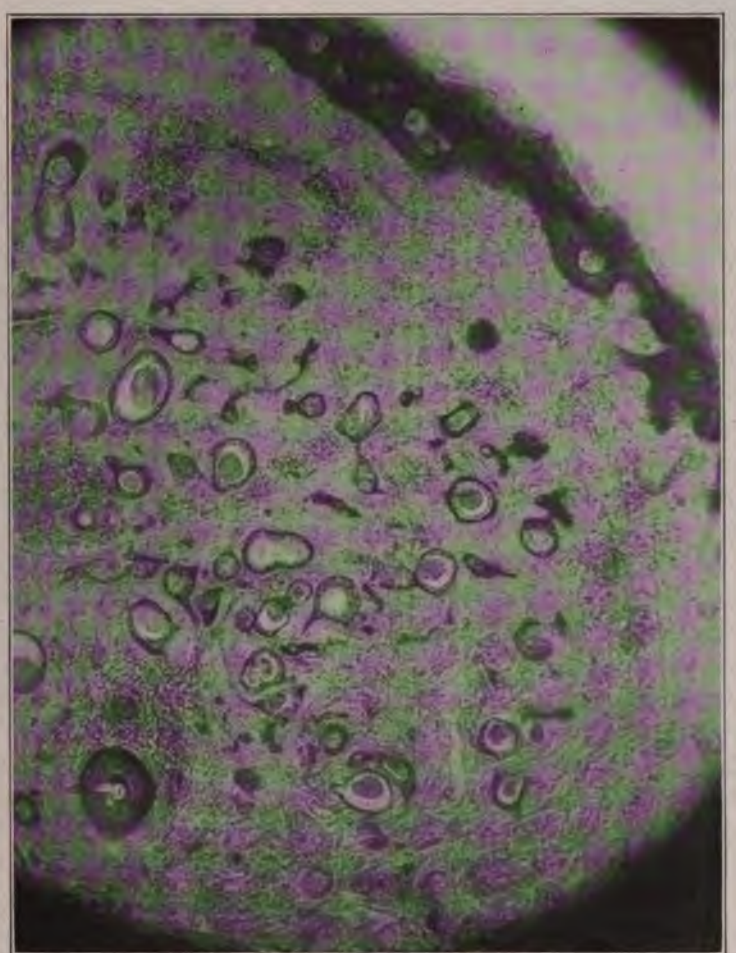

Fig. 471.—Syringocystadenoma, showing cysts and epithelial strands. Low magnification.

siderably lessened in number, exhibited no inflammatory changes, and the capillary endothelium appeared normal in every way.

The elastic tissue was somewhat reduced in amount, although the distribution of the fibers was but little altered and the elastic network completely encircled the cysts, as in the cases reported by

Dohi, Gassmann and Stockmann. Hair follicles and sebaceous glands were found in all of the nodules. Both the follicles and the appended glandular elements appeared to be normal. In those instances in which a complete longitudinal section of a hair follicle was secured, no budding or other abnormal condition was to be found. Occasionally, one of the long, wavy strands of epithelial cells, to be described later, was found in very close proximity to a pilo-sebaceous appendage, but careful search through the serial sections always showed the extremities to be free and not connected with the follicle in any way. In addition, the reaction of the component parts of the two structures to the various aniline dyes was entirely different, and invariably served as a trustworthy method of identification.

The coil glands were well developed, and exhibited no pathologic changes. In several instances the ducts could be traced entirely to the surface of the skin. There was no evidence of dilatation, or of cystic degeneration in either coil or duct, and no indication of budding or of other abnormal cell proliferation.

There was some collagenous degeneration of the connective tissue stroma, but the change was not marked.

Scattered through the cutis, from just below the basal layer of the epidermis down to the stratum of subcutaneous fat, were large numbers of round or oval masses of epithelium, and epithelial-lined tubules. Many of these cell collections possessed a stem-like appendage of epithelial cells, two cells in width, which frequently connected two or more of the glandular masses. In many instances these epithelial tracts were found extending in various directions through the corium. The nuclei of the cells were large, and stained much more deeply than those in the epidermis.

In several of the macroscopically normal sections from both sides of the trunk, similar strands of epithelial cells were found, and in one specimen several budding processes and a few cysts were present.

As Professor Welch has pointed out, the most important evidence in support of the sweat-gland theory of the histogenesis of these tumors is the resemblance between the epithelial strands, nests and cysts, and the tubules of normal coil glands. There is a manifest similarity between the narrow, often wavy or twisting strands of epithelium connected with the cysts and the normal tubules of coil glands, but most significant and convincing is the presence in many of the cysts and tubular strands of the double row of epithelial cells, the outer row flat and the inner row cubical, precisely the arrangement so char-

acteristic of the cellular lining of the sudoriparous tubules. While this arrangement is not in all places apparent in consequence of pressure of the contents of the cyst, proliferation of cells, and other obvious causes, it can be recognized in so many places that it cannot be doubted that it is a characteristic histologic feature of this class of tumors.

The decision of the question as to whether the tumor springs from previously normal sweat ducts or from congenital or acquired defects of the sweat glands is more problematic. Considerable weight is to be given the argument of Török, who made the first thorough study of the histogenesis of lymphangioma tuberosum multiplex, that the absence or rare occurrence of sweat glands in the area of the tumor, in contrast to the presence of these appendages in the normal skin, is indicative of the transformation of pre-existing sweat tubules into tumor elements. The findings in the case here reported tend to confirm this theory, and the fact that epithelial strands, similar to those found in the tumor areas, may and do occur in apparently normal regions is additional evidence in support of this hypothesis.

In favor of the congenital theory is the occurrence in so many instances of the affection in early life, and especially its occurrence in several members of the same family. Schidachi has produced similar cysts, even with epithelial strands, by occluding the sweat ducts, and Unna describes a budding epithelial process in spiroadenomata occurring in the neighborhood of varices of the leg apparently similar to the proliferative changes seen in some cases of lymphangioma tuberosum multiplex. Pick objects to regarding these growths as true adenomata, the question being whether there is anything in the nature of a true secretion. If the hyaline or colloid material in the cysts is merely the result of cellular degeneration the propriety of such names as cystoma and cystadenoma would be questionable, but Stockmann has apparently shown that, in some instances, the cysts and tubules contain genuine secretion, and the fact that some of the tumors in our case increased in size following the administration of pilocarpine would tend to confirm Stockmann's findings. Strictly speaking, these growths are benign cystic epitheliomata, although that name had best be reserved for the Brooke-Fordyce type of neoplasm, and a more appropriate and descriptive one adopted for tumors of this group. The designation "syringocystadenoma," suggested by Török, appears to me to be very appropriate, being expressive and at the same time concise.

Diagnosis.—The color, distribution, and consistence of the lesions should be sufficient to differentiate them from acanthoma adenoides cysticum, xanthoma, and the papular syphiloderm.

Prognosis.—There is no tendency to spontaneous regression. The tumors never become malignant.

Treatment.—Radiotherapy is probably the most satisfactory method of eradicating the growth. Surgical measures, electrolysis, or carbon dioxide snow may be tried in selected cases.

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SARCOID.

Synonyms.—Multiple benign sarcoid; Benign miliary lupoid.

Definition.—Fendt has defined as sarcoids "tumors of benign prognosis, having only a limited growth, frequently healing with arsenic, composed of groups of round cells, which are circumscribed, divided by septa and encapsulated." Kaposi suggested that the term sarcoid be employed to designate a group of diseases which included mycosis fungoides, lymphodermia perniciosa, and sarcomatosis cutis, but as accepted at present the designation is restricted to a small, and somewhat rare, group of tumors which practically fulfill the definition formulated by Fendt. In 1910 Darier made an exhaustive study of the disorder, and separated all of the cases that had been reported up to that time into four definite groups:

1. Multiple benign sarcoid of Boeck.
2. Subcutaneous sarcoid of Darier-Roussy.
3. Erythema induratum-like sarcoid of the extremities.
4. Sarcoid of the Spiegler-Fendt type, non-tuberculous, and composed of round cells, not unlike certain of the neoplastic lymphodermata.

In reality, Darier's classification includes two main types of growths—the first and last being non-tuberculous, the second and third tuberculous.

Symptoms.—The multiple benign sarcoid of Boeck is characterized by the presence of a few or several sharply defined, yellowish, reddish or brownish, cutaneous and subcutaneous nodules and plaques which

are asymmetrically distributed over the face, or the extremities, or both. Jamieson has recently reported a very interesting case in which the lesions were confined to the nuchal region. The tumors are benign in character. When they undergo involution, either spontaneously or as a result of arsenical medication, they may leave no trace, or a pigmented spot, or a thinned, atrophic, scar-like area may remain to mark the site of the former lesion.

Boeck has divided the type described by him into three varieties: (1) a large nodular; (2) a small nodular or papular; (3) a diffuse

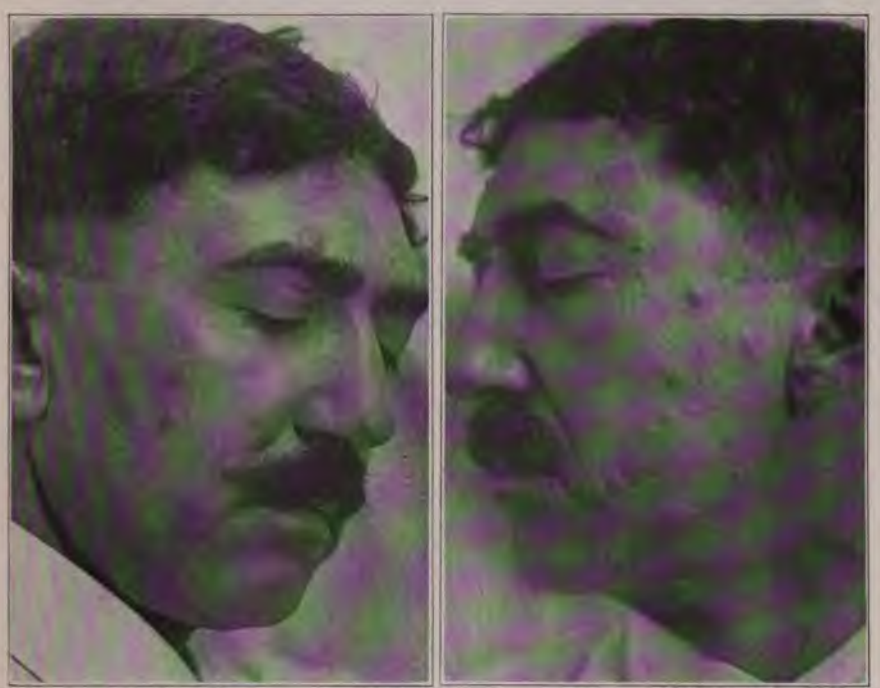

Fig. 472. Fig. 473.

Figs. 472 and 473.—Boeck's sarcoid. (Courtesy of Dr. Joseph Zeisler.)

infiltrating form. The cases may be atypical, or mixed, as in the instances reported by Howard Fox and G. H. Fox and Wile. The tumors may vary in number from one or two to many hundred. The face is the site of predilection, although examples have been reported involving practically all parts of the body. The lesions usually begin as minute, firm, rounded nodules which may appear in crops but develop very slowly. The surface is covered by a fine network of capillaries. After attaining a certain size (from that of a split-pea

to that of a walnut), and persisting for months or years the growths may undergo spontaneous regression. They never break down or ulcerate. The mucous membranes have been involved in a few of the reported cases, and the internal organs in one instance. There are no constitutional or subjective symptoms.

Fig. 474.—Multiple benign sarcoid of the skin. (Courtesy of Dr. Joseph Zeisler.)

The subcutaneous sarcoid of Darier-Roussy is rare, and probably corresponds to Wende's nodular tuberculosis of the hypoderm, although Nobl believes it belongs to the erythema induratum group. The lesions are rounded or oval, subcutaneous, hazelnut- to walnut-sized tumors. Darier's sarcoid of the extremities usually occurs in women, and resembles the erythema induratum of Bazin. The lesions are painless, and seldom ulcerate. The extensor surfaces are those

commonly involved. The patients usually give a positive reaction to tuberculin (in fact, Philippson found tubercle bacilli in sections from his case), and it is extremely probable that the disease is identical with Bazin's malady. Volk believes that both classes 2 and 3 of Darier's group are representatives of this disease.

In sarcoid of the Spiegler-Fendt type the tumors are located on the body, and are dark red or lilac in color. The growths do not tend to break down, but are chronic in their course. They usually respond favorably to arsenical medication.

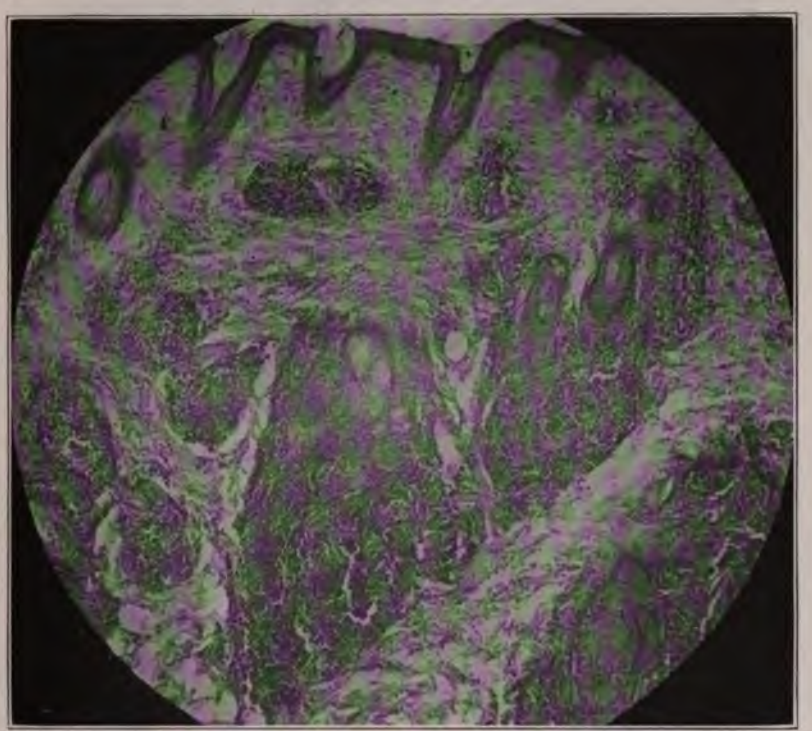

Fig. 475.—Boeck's sarcoid, showing location and extent of cellular infiltration. Moderate magnification.

Etiology and Pathology.—The causes of Boeck's sarcoid and of growths of the Spiegler-Fendt type are unknown. It has been suggested that they, like the subcutaneous sarcoid of Darier-Roussy and the erythema induratum-like sarcoid, are tuberculous, but the relationship has not been proved. The favorable effect of arsenic on the lesions is in itself a strong point in favor of their non-tuberculous nature. Histologically, tumors of the Boeck type consist of sharply

defined collections of epithelioid cells with pale-staining nuclei, the masses being separated by connective tissue septa, within the meshes of which are a few giant cells and lymphocytes. The nodules contain vessels, but no elastic tissue. Caseation never occurs. Epithelial changes, if present, are purely secondary.

The Spiegler-Fendt sarcoid is composed of round cells, with an occasional epithelioid or giant cell. It is probable, as Fox and Wile have

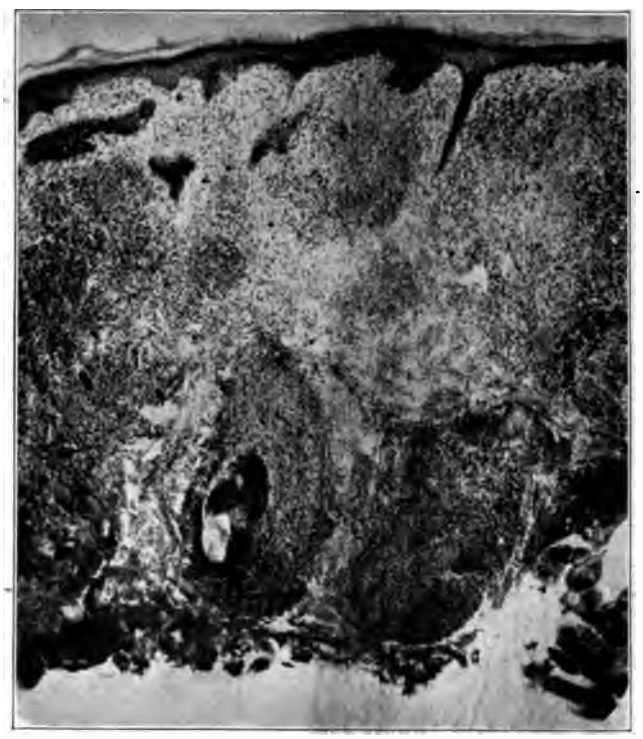

Fig. 476.—Sarcoid of Boeck. Moderate magnification. (Courtesy of Dr. Joseph Zeisler.)

stated, that many of the cases of "sarcoma" of the skin that have been cured by arsenic really belong in the sarcoid group.

Diagnosis.—The lesions are to be differentiated from those of erythema induratum, leukemia cutis, and nodular tuberculosis of the hypoderm. In many instances it will be found necessary to resort to a microscopic examination before a positive opinion can be reached.

Prognosis.—In uncomplicated cases the outlook is good. There may be some subsequent scarring, but the tumors usually disappear, either spontaneously or as a result of treatment.

Treatment.—In both Boeck's sarcoid and growths of the Spiegler-Fendt type arsenic appears to be a specific. Locally, Unna found ichthyol of value.

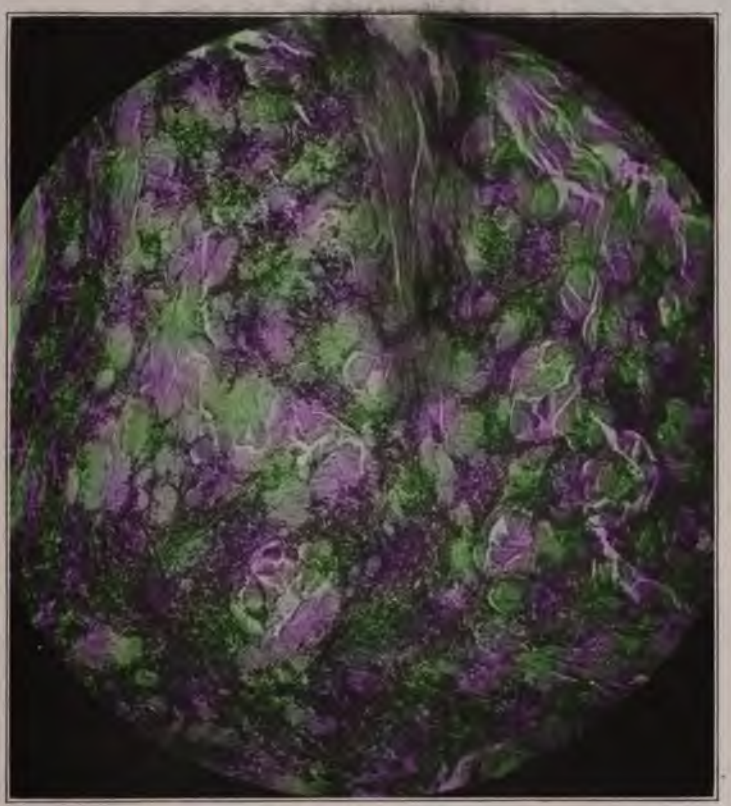

Fig. 477.—Spiegler-Fendt sarcoid. Moderate magnification.

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CARCINOMA CUTIS.

All carcinomata are made up of connective tissue (stroma) and epithelial cells (parenchyma). The stroma may consist wholly of newly formed tissue, as in growths of the pedunculated and expansile types, or it may be derived from both old and new fibrous tissue, the former being supplied by the involved organ, and the latter by a reactive growth of the pre-existing connective tissue. While all carcinoma cells are epithelial, so far as is known there is no specific carcinoma cell. In general the more rapidly a carcinoma grows the more closely its cells resemble the undifferentiated embryonal cell (Hertzler). Cutaneous carcinomata are best classified according to the cells from which they spring, and may be separated into these general groups: (1) Squamous-celled, or prickle-celled cancers, slow-growing tumors derived from the outer layers of the epidermis, and characterized by the presence of pearl-like formations; (2) Basal-celled cancers (the carcinoma baso-cellulare of Krompecher), comparatively benign growths, which do not metastasize, and are composed of small, deeply staining epithelial cells of various sizes and shapes; (3) Cancers of the mucous membrane type, growths of unusually malignant character and rapid development, which spring from the squamous cells lining certain mucous cavities (lips, tongue, gums), and which seldom form pearls, but frequently ulcerate, and become fungiform; (4) Glandular carcinomata, originating in glandular tissue, and involving the skin secondarily.

A popular, but extremely inaccurate, method of classifying carcinomata is according to the amount of connective tissue or according to the type of degeneration present. Thus, if the fibrous tissue is in excess the growth is called a scirrhous cancer; if the connective tissue and the cells are in about equal proportions, a carcinoma simplex, and if the cells are relatively in excess, an encephaloid carcinoma. Following out the same line, we may have colloid cancer, hyaline cancer, etc. In a treatise of this character, the general symptomatology of the disease is far more important than its pathologic phases, particularly if the exact status of the latter is still a matter of controversy. Consequently, the descriptions which follow are mainly clinical.

SQUAMOUS-CELLED CARCINOMA.

Synonyms.—Epithelioma; Skin cancer; Epidermoid carcinoma; Cancroid; Carcinoma epitheliale; Prickle-celled carcinoma.

Fig. 478.—Squamous-celled carcinoma of the lip, showing result of x-ray treatment. (Courtesy of Dr. W. L. Brosius.)

Fig. 479.—Prickle-celled carcinoma of the skin, with numerous seborrheic keratoses.

Fig. 480.—Prickle-celled carcinoma of the ear developing on the base of an old keratosis. Part severely frostbitten three years previously.

Definition.—A malignant growth originating in the squamous layers of the epidermis, and characterized by the formation of pearl-like epithelial masses in the interior of the invaded organs.

Symptoms.—The earliest perceptible lesion in squamous-celled cancer of the skin is frequently a roughened, warty, keratotic patch (a seborrheic keratosis). Occasionally, however, the tumors begin as small, reddish or yellowish, scale-covered, deep-seated nodules. In the course of a few weeks or months some portion of the gradually enlarging growth breaks down, and a superficial ulcer, which at first is partially or entirely hidden by the overlying scales and crusts, results. The base is always sharply defined, and more or less indurated.

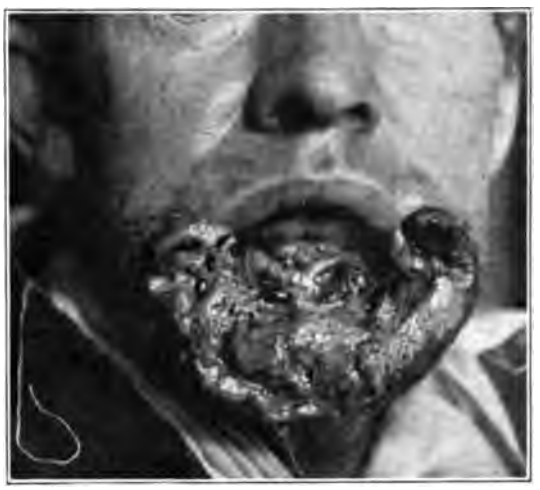

Fig 481. Prickle-celled carcinoma of lip which developed from a seborrheic keratosis.

There is frequently an associated dilatation of the superficial capillaries. The growth gradually increases in size by peripheral extension, and the central ulcerating area also slowly extends. The edges of the tumor are hard, everted, and are generally undermined, and, as the growth extends, connective tissue, cartilage, periosteum, and bone are attacked with equal impartiality. Secondary lymphnode involvement is the rule, and the development of metastatic tumors in the internal organs also is a not uncommon sequel. The majority of the patients are middle-aged or elderly individuals. The sites of predilection are the face, particularly the lips, and the dorsal surface of the hands. The papillary variety of squamous-celled carcinoma may be papillomatous from the beginning, or it may develop

secondarily from the type just described. The resulting lesions are cauliflower-like, with a broad or slightly constricted neck and a fissured, verrucose surface which is covered with a tenacious, foul-smelling, yellowish, purulent exudate. In this variety also the neighboring lymphnodes are usually implicated, and the more deeply seated structures ultimately are involved. Pain is a prominent feature, particularly late in the disease.

Cancers of the mucous membrane type, which are but modified squamous-celled carcinomata, may be primary or secondary in origin. The mucous covering of the tongue, the mucous lining of the

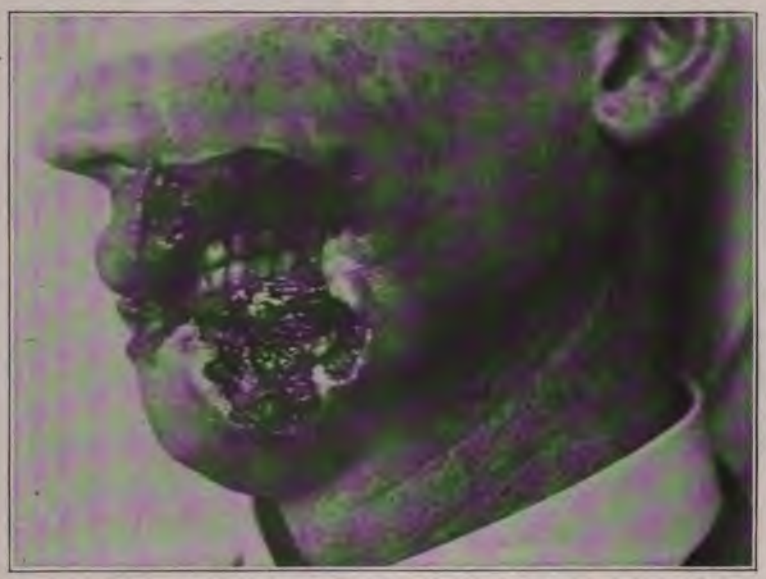

Fig. 482.—Prickle-celled carcinoma of jaw.

buccal, oral and nasal cavities, and of the vagina, rectum, balanopreputial sac, all are subject to this type of malignant growth. On the tongue and buccal mucous membrane the disease may begin as a small, superficial, reddish excoriation, or as a minute fissure, with a densely infiltrated base. The presence of leucokeratotic plaques, "smoker's patches," is a strong predisposing factor. Lymphnode and glandular involvement speedily occur, and pain is an early and persistent feature. As a result of the location of the involved areas, papillary growths—warty, filiform, or cauliflower-shaped—are not uncommon.

Carcinoma lenticulare and *carcinoma tuberosum* are examples of the so-called scirrhous type. Both usually develop secondarily to cancer elsewhere in the body. In lenticular carcinoma the lesions, which commonly involve the breast, are pinhead- to cherry-sized, whitish or pinkish nodules, the surfaces of which are often marked by dilated capillaries. In the course of a few weeks or months the lesions increase in number until the entire chest, and even the shoulders and back are studded with the little growths *(cancer en cuirasse)*. As a result of coalescence, hard, nodular plaques are formed, and ultimately, owing to the thickening and hardening of the skin, the upper trunk may become fixed and almost immovable. Sooner or later, ulceration occurs, and the patient finally succumbs, either to marasmus or to some intercurrent affection.

Fig. 483.

Fig. 484.

Fig. 483.—Prickle-celled carcinoma of nose, involving upper lip.

Fig. 484.—Prickle-celled carcinoma of penis. Inguinal lymphnodes involved. (Courtesy of Drs. Logan Clendenning and John Outland.)

Carcinomata of the tuberous type are usually secondary, but may be primary, as in the case reported by Röseler. The lesions are pea- to hen-egg-sized, brownish or bluish in color, and of wide distribution. At first subcutaneous, they gradually grow toward the surface, and finally break down and form painful, discharging ulcers superficially

resembling syphilitic rupia. As in lenticular cancer the prognosis is hopeless.

Pigmentary or Melanotic Carcinoma.—The results of recent investigations indicate that the majority of the melanin containing growths which spring from pigmented nævi are carcinomatous rather than sarcomatous in nature. The growths may be pinhead- to hazelnut-sized or larger. They may be single, but usually are multiple. The pigment occurs in both the cells and the stroma. Clinically, the lesions may be flat or slightly elevated, papillomatous or fungoidal. They are very malignant, and often terminate fatally. Radical excision offers the only hope.

Fig. 485.—Prickle-celled carcinoma of the face. (Courtesy of Dr. Anstruther Davidson.)

Etiology.—The essential cause of squamous-celled carcinoma is unknown. Heredity is probably a predisposing factor in some instances. As Pusey has intimated, an important factor in its etiology is a peculiar quality of the skin, a quality which may be inherited, but is usually acquired, and which is characterized by harshness and dryness, with more or less evidence of long standing, dry seborrhea. The disease is one of adult life, and males are attacked more frequently than females (3 to 1), possibly because of their exposure to the action of irritants. The white race is more susceptible than the colored. Trauma, of mechanical, chemical, thermic

or actinic origin, plays a prominent part in the causation of many cases. Pipe smoker's cancer and chimney sweep's cancer were formerly comparatively common affections, and even today workers in tar and paraffin, and farmers and sailors who are constantly exposed to sun and wind, are frequent victims of the disease. Although the face and hands are the most common seats of the malady as it occurs in this country, in a statistical study of 1,189 cases admitted to Kashmir Mission Hospital, Neve found that more than 70 per cent of the growths had developed on the thighs and abdomen, a result of friction, heat and irritation from the portable firebox used by the natives. The lesions occasionally develop at the site of old injuries, especially in

Fig. 486.—Prickle-celled carcinoma of scalp. (Courtesy of Dr. John W. Perkins.)

scars following gummatous ulceration, and burns. They also occur as sequelæ in a small percentage of chronic dermatoses such as lupus vulgaris, lupus erythematosus, arsenical keratoses, and psoriasis. Certain types of nævi, especially pigmentary nævi, are prone to undergo malignant change, especially following slight injury.

Pathology.—In growths of the squamous-celled type, long, finger-like epithelial projections extend downward into the connective tissue, and round or oval pearly masses, made up of cornified epidermal cells, are formed in both the subjacent structures and in metastases in the lymphnodes. As Born, Peterson, Hertzler, and others have

demonstrated, however, the formation of true "nests" is more apparent than real. The growth spreads out like the roots of a tree, and a single cross-section may show groups of isolated cells and pearly masses which, upon reconstruction, will be found to be connected with the main body of the growth. The pearls are groups of cells arranged concentrically which present progressive changes from the periphery toward the center, corresponding to the changes in the normal epidermis from the deep layers to the surface (Hertzler). Histologically, the little bodies, which have a marked affinity for the

Fig. 487.—Multiple carcinomata of the skin. (Courtesy of Dr. T. W. Allworthy.)

acid dyes, consist of spindle-shaped cells with large ovoid nuclei and a structureless protoplasm.

Diagnosis.—The history of the case, the age of the patient, and the clinical character of the lesion are generally sufficient for recognition. The growths are usually single, and of slow development. They tend to ulcerate early, and are frequently covered by a thick scale or crust. On the mucous surfaces the bases of the lesions are more or less indurated, and the abraded surface fails to respond favorably to the application of mild astringents and caustics. Lymphnode involvement occurs late in the course of the disease, and is usually of unilateral and localized distribution. The lesions may be confused

with those of lupus vulgaris and syphilis. Lupus vulgaris usually occurs in childhood, and the nodules are soft, brown, and "apple-butter-like." The primary lesions of lues may bear a striking, if superficial resemblance to cancer, particularly if the lip be the part affected. The rapid development of the tumor, however, together with the early involvement of the associated lymphnodes, and the presence of the spirocheta pallida should prevent error. The configuration, con-

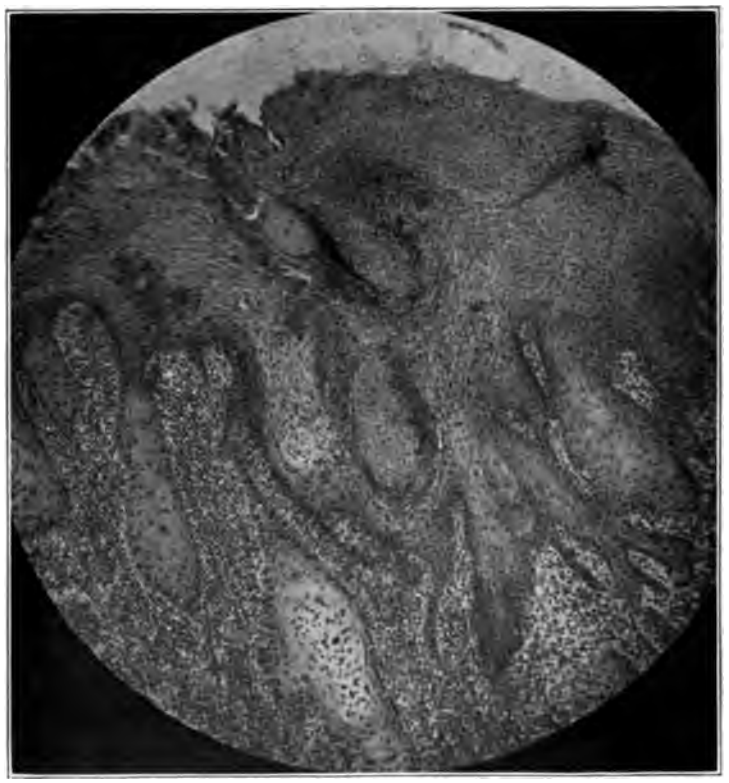

Fig. 488.—Prickle-celled carcinoma of lower lip, showing hyperkeratosis, papillary hypertrophy, pearl formation, and cell infiltration in derma. Low magnification.

sistence, color and history of the tubercular syphiloderm, together with the presence, in the majority of instances, of a positive serum reaction should serve for recognition.

Prognosis.—The prognosis is dependent upon the duration, extent, and location of the lesion. In the majority of instances the outlook is grave, particularly if the growth be located on the lip, in the

parotid region, or on the back of the hand. The earlier treatment is instituted, the greater chance there is for complete recovery.

Treatment.—The treatment of squamous-celled carcinoma of the skin consists in the removal or destruction of the growths by various means. This can be accomplished by excision, curettage, cauteriza-

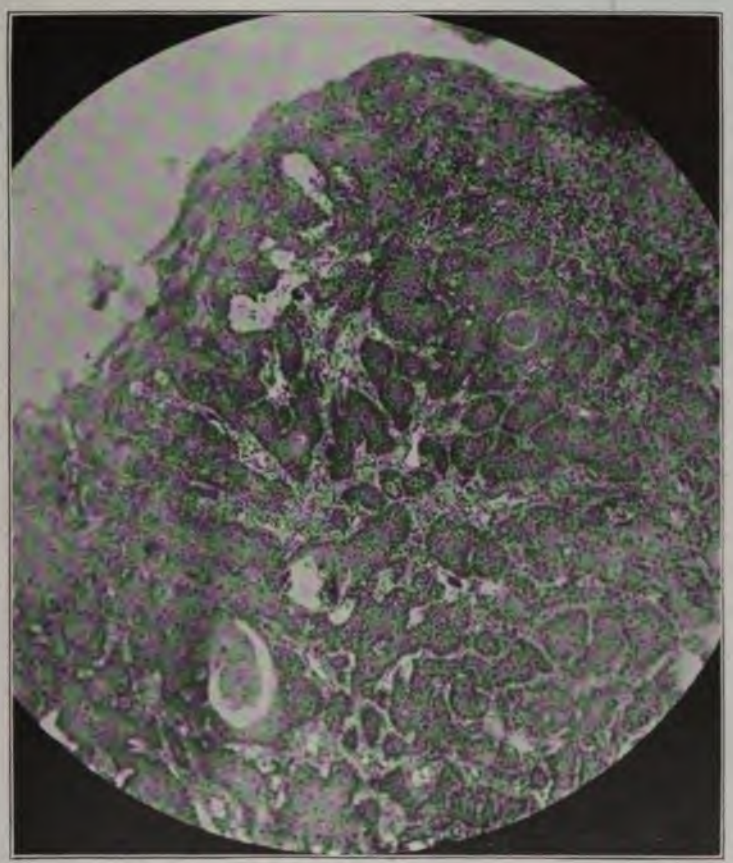

Fig. 489.—Prickle-celled carcinoma of the tongue. The lesion developed on a patch of leukoplakia of long standing. Moderate magnification. (Courtesy of Dr. W. K. Trimble.)

tion with chemicals or by means of the actual cautery, and the x-rays or radium. Surgical interference is particularly applicable in cancer of the lip (as Bloodgood has demonstrated), and, despite the fact that Pusey and other expert röntgenologists have successfully attacked the disease in this region with the x-rays, in the majority of instances the patient is far safer in the hands of a competent surgeon than else-

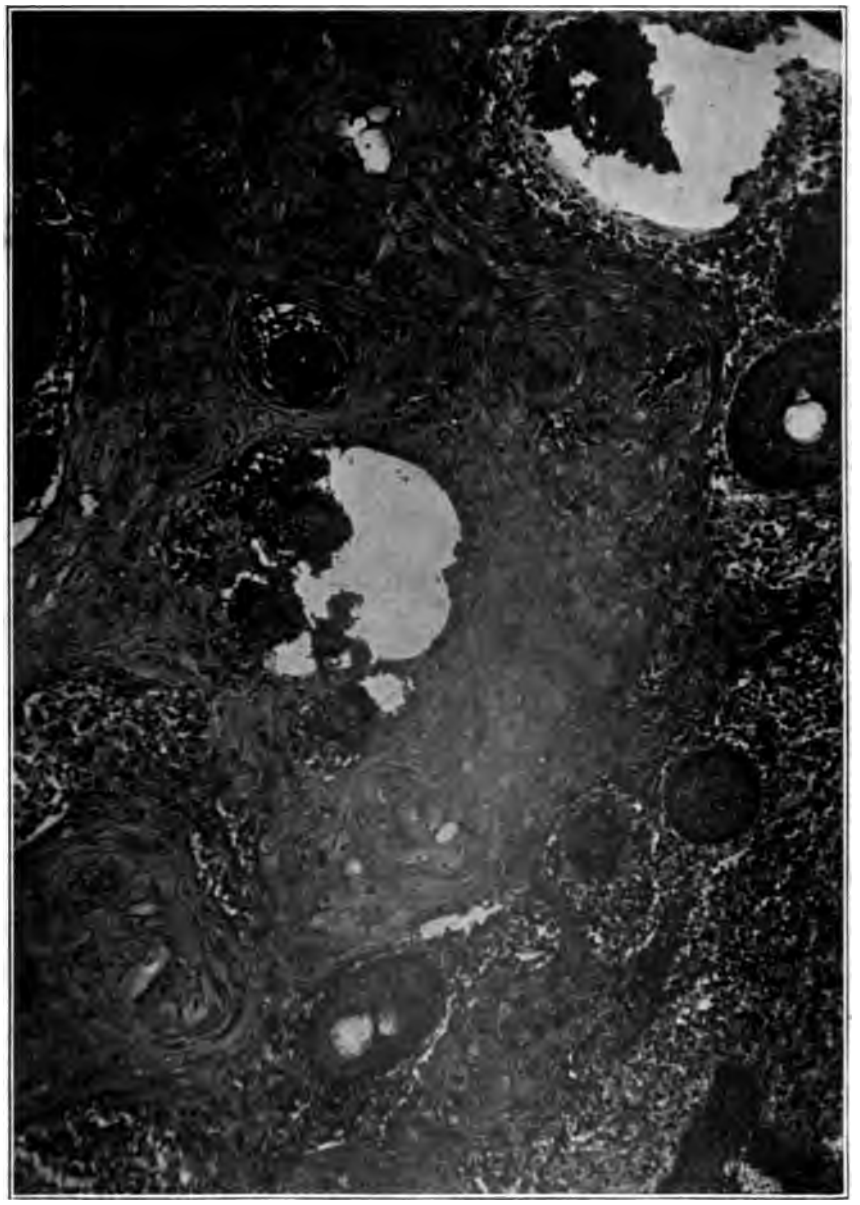

Fig. 490.—Prickle-celled carcinoma of cheek. Moderate magnification.

where. Caustics are less popular than in former years, but, when properly employed, excellent results follow their use. In the treatment of very superficial growths, such as seborrheic keratoses which are just beginning to exhibit degenerative changes, thorough freezing with carbon dioxide snow often proves curative. All of the overlying scales and crusts should first be removed and a hard stick of snow then applied under heavy pressure, for from one to three minutes. Sherwell strongly recommends the acid nitrate of mercury as

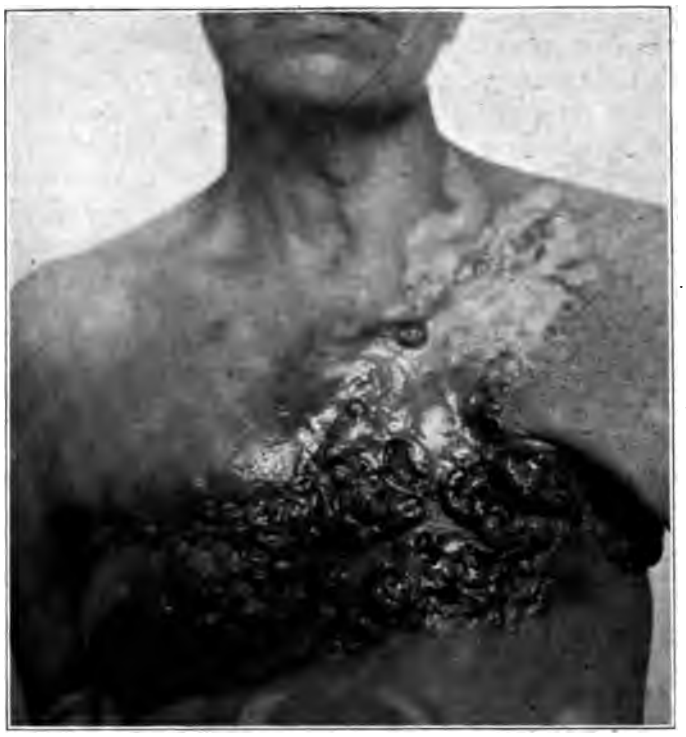

Fig. 491.—Carcinoma en cuirasse. The healthy scar tissue is a result of fulguration. (Courtesy of Dr. Howard Morrow.)

a caustic, and in selected cases, I have found the remedy a valuable one. The lesion is first scraped away with a sharp curette, the area sponged dry, and a 60 per cent acid nitrate of mercury solution freely applied. It is usually advisable to counteract the effect of the drug with an alkali (sodium carbonate or bicarbonate) at the expiration of a few minutes. The entire area is then cleansed with water, dried, and painted with tincture of iodine.

Clark, Gottheil, Hazen, and Bloodgood speak highly of the use of the actual cautery; and I have found it a valuable agent. In addition to destroying the growth, it seals the efferent vessels, and thus aids in preventing metastasis. New employs both heat and radium, particularly in dealing with cancer of the cheek.

Of the various cauterizing agents that have been recommended for the more deeply seated growths, pyrogallol, arsenious acid, caustic potash, and zinc chloride are probably the most popular. Pyrogallol has a selective action on cancerous tissue, and is less painful than the others. It may be applied alone or combined with salicylic acid (10 per cent), in simple ointments in strengths of from 10 to 25 per cent. The preparation should be spread on cloth, and its use continued for from several days to a fortnight. Arsenious acid is a valuable but painful caustic, and is the active ingredient in "Marsden's paste." It is employed in strengths of from 30 to 50 per cent, a favorite combination consisting of arsenic 1 part, powdered acacia 1 part, water sufficient to make a stiff paste. Stelwagon recommends that a saturated solution of cocaine be used in place of the water. The paste is applied on rubber for a period of from twelve to thirty-six hours, and the resulting slough separates in the course of a fortnight to six weeks. Potassium hydroxide is a painful caustic, and is to be employed with care. All scales and crusts are first removed, and the surrounding tissue protected by a thick coating of vaseline. The solid stick is then applied for from one to five minutes. The part is then repeatedly bathed with a dilute solution of acetic acid or with vinegar. Zinc chloride has a non-selective action, and is painful, but very little sloughing follows its use. Bougard's paste is probably the form in which it is most widely used:

℞ Tritici farinæ,
Amyli pulveris .....āā ʒ i (30.0)
Hydrargyri sulphidi rubri,
Ammonii chloridi .....āā gr. xl (2.6)
Arsenii trioxidi pulveris.....gr. viii (0.5)
Hydrargyri chloridi corrosivi.....gr. iv (0.25)
fiat pulvis; adde
Zinci chloridi .....ʒ i (30.0)
Aquæ fervidæ .....fʒ ii (60.0)
Misce.

The resulting paste is spread on cloth and applied for from twelve to forty-eight hours. The ensuing slough separates in from one to four weeks. A second application sometimes is required. The actual

cautery is applicable in those instances in which a good cosmetic result is of secondary importance. Small growths can be quickly and effectually destroyed by means of Unna's "microbrenner." Fulguration and similar methods have nothing in particular to recommend them, their action is not selective and they are usually very painful. During the past few years, much has been accomplished in the treatment of cancer by Röntgen-therapy, and the method is widely employed at the present time. Its principal advantages consist in its selective action on malignant tissue (which possesses a lower resistance than normal structures), its painlessness, and the excellent cosmetic results that follow its use. The agent may be employed in massive, erythema doses (as recommended by MacKee, E. H. Skinner, Pfahler, and others), or in broken doses (of from three to fifteen minutes' duration, at a tube distance of fifteen centimeters). The surrounding healthy tissue should be carefully protected by means of lead-foil. For screening purposes, resort may be had to chamois, heavy leather, or aluminum. In the majority of instances it is not necessary to secure a marked reaction. The exposures are given daily or on alternate days for a period of from one week to a fortnight, or until the skin becomes slightly erythematous. Treatment is then discontinued for a week or longer, until all signs of inflammation subside, when the exposures are resumed. In many instances the growths disappear quite promptly, in the course of a few weeks to a few months, and do not recur. Occasionally, and particularly if the case is one involving the lip or the parotid region, it is best to excise the growth and follow this by radiotherapy. Individuals with light, fair skins are usually more susceptible to the x-rays than brunettes, a fact which should be borne in mind when treatment is instituted. Radium is a very efficient agent in the treatment of localized lesions. In attacking superficial carcinomata no screen need be used, and an exposure of 30 mgm. hours is usually sufficient to destroy the growth. In the majority of instances the reaction is apparently quite severe, but it disappears in the course of ten days or a fortnight, and the growth generally disappears with it. In the more deeply seated tumors, a 1 or 2 mm. screen should be employed, and much longer exposures given. Occasionally better results can be secured by "cross-firing," applicators being placed on opposite sides of the tumor. I have found the cosmetic results following its use superior even to those obtained by Röntgen-therapy, and the agent is an exceedingly simple and convenient one to use.

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BASAL-CELLED CARCINOMA.

Synonyms.—Carcinoma baso-cellulare; Epithelioma; Rodent ulcer; Cancroid.

Definition.—A comparatively benign variety of carcinoma of the skin, which probably develops from the basal layer of the epidermis or from the skin glands, does not metastasize, and is composed of small, deeply staining cells of various forms.

This variety of cancer was first accurately described by Krompecher in 1902. Although many authorities refuse to accept Krompecher's classification of cutaneous carcinomata, on the ground that

Fig. 492.—Basal-celled carcinoma of the face, before and after treatment with the x-ray. (Courtesy of Dr. W. L. Brosius.)

he has failed to conclusively prove a basal-cell origin for his "carcinoma baso-cellulare," the division suggested by him is a logical one, and has done much to clarify our knowledge regarding cancer of the skin.

Symptoms.—In typical basal-celled carcinomata there is much less scaling and crusting than in the squamous-celled growths. The tendency is toward lateral progression rather than deep involvement. The lesions usually appear first as small, shiny, whitish, or reddish, translucent nodules, although rarely they may begin as scaly patches, or as seborrheic keratoses. The face is the site of predilection, but oc-

casionally the hands, and even other parts of the body are involved. The lesions may be single or multiple. They seldom give rise to subjective symptoms, and sometimes persist for weeks or months before ulceration takes place. When this does occur, it generally involves only a part of the growth, and the remaining portion slowly spreads peripherally, extending often by the formation of a few or several small, pearly, oval-topped, satellite nodules. The ulcerated

Fig. 493.—Basal-celled carcinoma of face. More than fifty of the lesions are present, the largest being about the size of a grain of wheat.

area heals slowly, leaving a smooth, atrophic cicatrix. This lateral, steadily progressive method of extension is typical of this variety of cancer. In some instances the advancing margin is broad and band-like, and the cicatrized area smooth, flattened and ivory-colored, superficially resembling a patch of circumscribed scleroderma. This is the so-called "morphea-like epithelioma," cases of which have

been described by Hartzell, Stelwagon, Hazen, Pusey, Heidingsfeld, and others. I have encountered several typical examples.

The tendency to destruction is not nearly so great in this as in the squamous-celled variety, but in certain localities, such as the ala of the nose, or the margin of the eyelid, extensive ulceration often results. Men are attacked more frequently than women. The majority of cases occur in adults, although Hartzell has reported an example in a boy of fourteen.

Fig. 494.—Basal-celled carcinoma of face. (Courtesy of Dr. Frank J. Hall.)

Fig. 495.—Basal-celled carcinoma of the skin. Prompt recovery following curettage and application of radium. (Dr. W. M. L. Witter's patient.)

Etiology and Pathology.—The cause of basal-celled carcinoma is unknown. Certain predisposing factors are recognized. Chief among these is a harsh, dry condition of the skin which may be inherited, but is usually acquired, and which is also extremely susceptible to growths of the squamous-celled variety. Occasionally the two types

are found in the same individual. In a case with multiple lesions, studied by Loeb and Sweek, the patient had previously received a number of x-ray treatments for the tumor which had first developed.

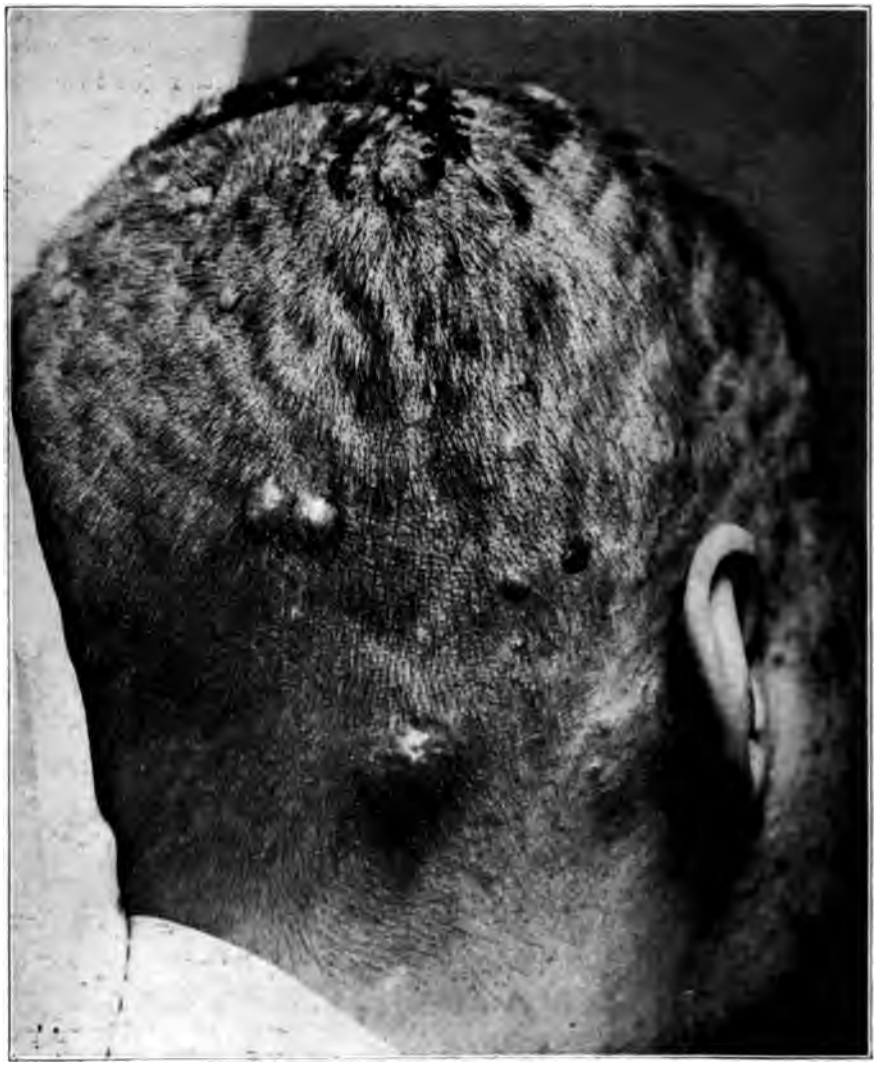

Fig. 496.—Basal-celled carcinoma of the scalp, the endothelioma capitis of Kaposi. (Courtesy of Dr. H. C. Varney.)

I have several times noted the appearance of new lesions following the partial or complete destruction of the primary nodule. The ques-

Fig. 497.—Basal-celled carcinoma of nasal region.

Fig. 498.—Multiple basal-celled carcinomata of the skin involving the ear in a patient whose left ear and cheek had been severely frostbitten on two different occasions. There are several keratoses on both cheeks.

Fig. 499.—Basal-celled carcinoma of the so-called "Rodent ulcer" type. (Courtesy of Dr. Howard Morrow.)

Fig. 500.—Basal-celled carcinoma of cheek. (Courtesy of Dr. T. W. Allworthy.)

tion of a possible relationship between the growths in multiple basocellular carcinoma is an extremely interesting one. It may be that

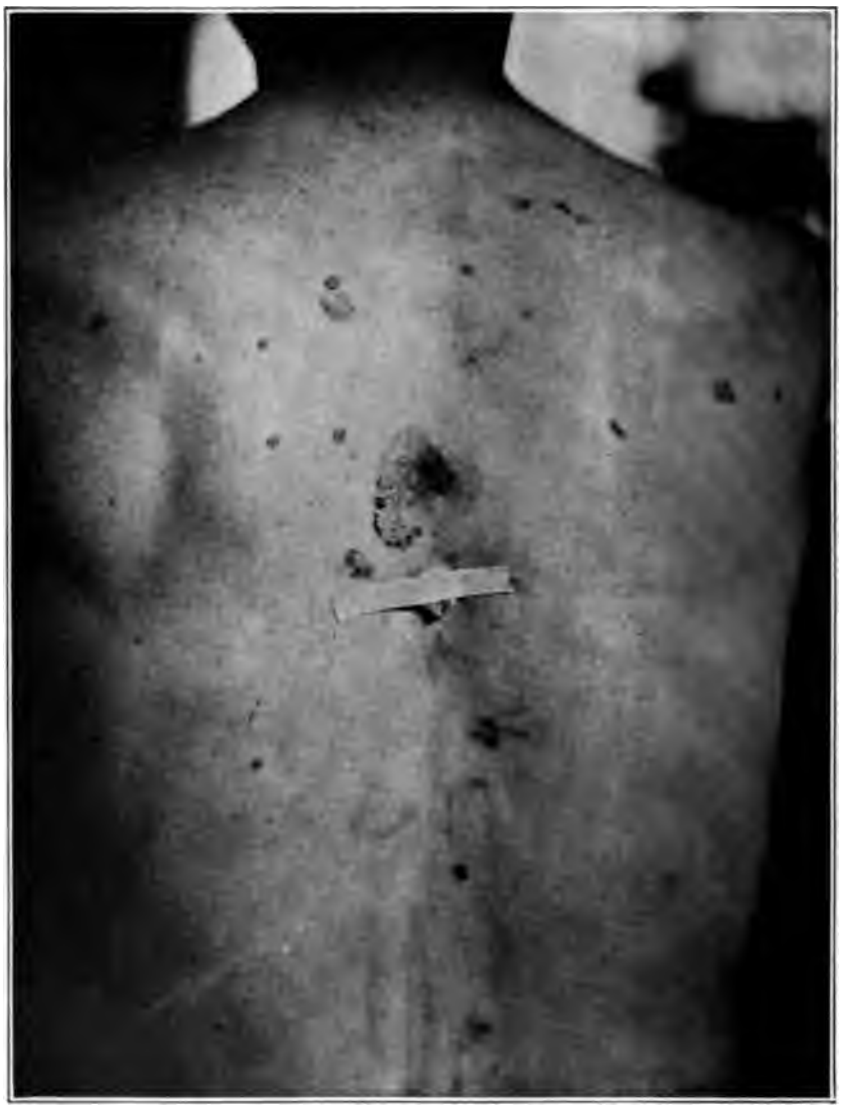

Fig. 501.—Multiple basal-celled cancer of skin. Twenty-one lesions on dorsal surface of trunk. Adhesive marks site of biopsy wound.

in some instances, when the earlier lesions are untreated or insufficiently treated, a shower of infectious particles is thrown off ulti-

mately to lodge at various parts in the body. The subsequent behavior of these particles is entirely dependent upon their new environment, and the basal layer of a properly prepared epidermis may serve for them the same purpose that certain areas on the heart valves occasionally serve the streptococcus viridans. Histologically, the development of the cancer masses can be studied best in the early le-

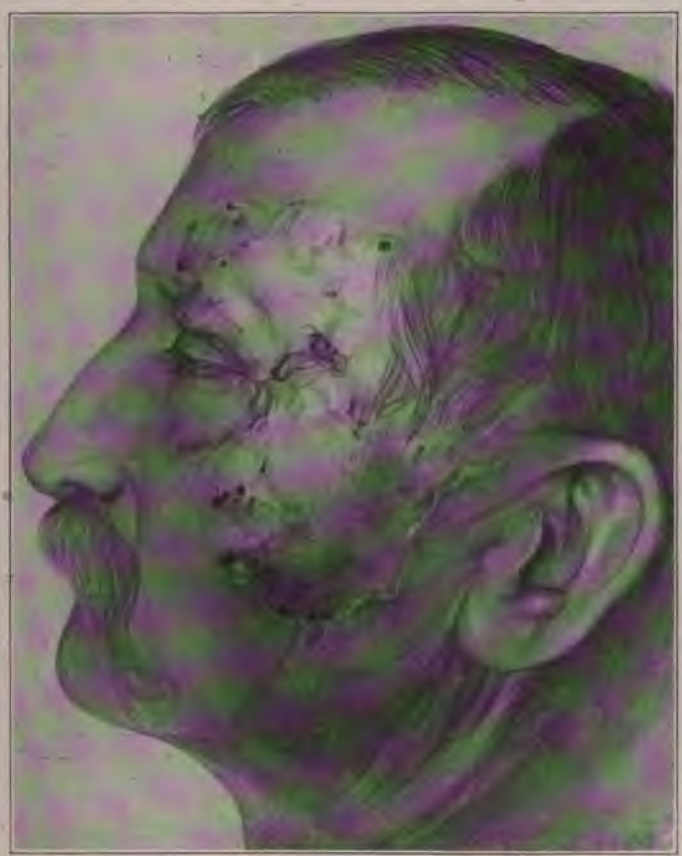

Fig. 502.—Morphea-like epithelioma. (The "carcinoma baso-cellulare superficiale cicatrisans" of Howard Morrow.)

sions. The process apparently begins in the basal layer of an otherwise normal interpapillary body. The affected elements can be readily differentiated from the normal by a slightly decreased affinity for the basic dyes. As Loeb and Sweek have suggested, the character of the downgrowth is probably governed more by the resistance of the underlying structures than by any other one factor. The course

and progress of the cancerous projections are largely dependent on the comparative density of the tissues involved. In some instances, the loosely interwoven character of the connective-tissue bundles offers but little resistance to the downward growth of the tumor, consequently we find long, sinuous strands of cancer cells extending far into the corium. Probably the coalescence of these strands at various points is largely a matter of chance. If the paths of lowered resistance cross, coalescence takes place, or if the outer zone of pressure is greater than the inner, the ever-increasing size of the masses

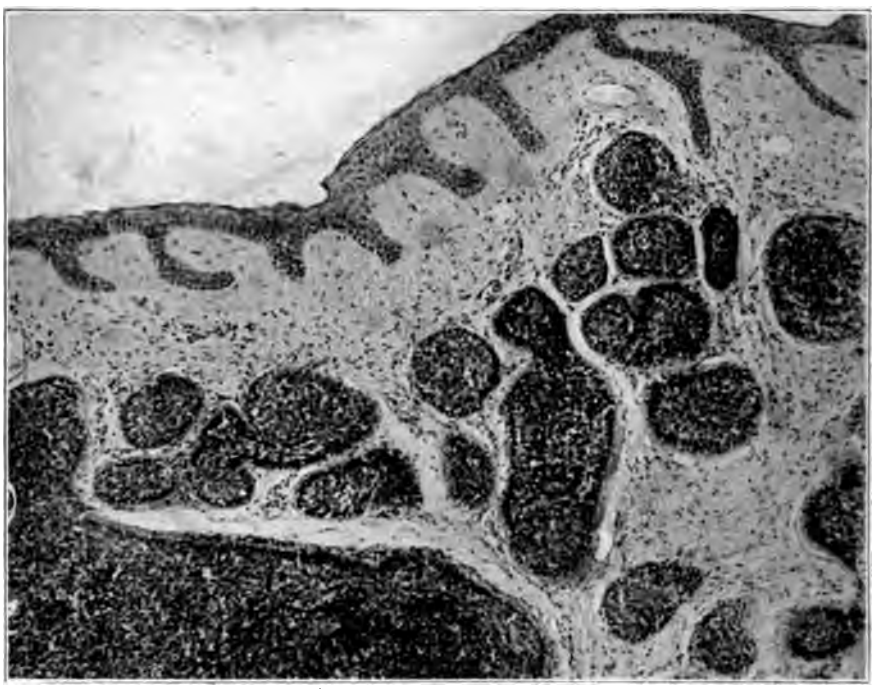

Fig. 503.—Section from a case of basal-celled carcinoma of scalp ("endothelioma capitis" of Kaposi). Low magnification. (Courtesy of Dr. H. C. Varney.)

finally forces them together, a core or island of connective tissue frequently being included. If the resistance is greater, the epithelial tumors are short and acorn-shaped, occasionally with a cystic center which probably consists of disintegrated cancer cells. If the connective tissue proves almost impenetrable, a few strands of cancer cells manage to creep far downward into the corium but the vast majority remain on the surface, and as keratinization never takes place in carcinomas of this type, the succulent, prolific cell-masses

form a high, slanting wall completely around the affected area. In the earlier lesions, round-cell infiltration in the vicinity of the projecting tumors is the exception rather than the rule. On the contrary, a thin layer of almost acellular connective tissue frequently separates the tumor mass from the subpapillary stroma. In the older growths inflammatory changes in the corium are not infrequent.

Diagnosis.—The hard, burnished, sharply defined character of the lesions, the absence of marked crusting and scaling and of lymph-node involvement, and the tendency to lateral progression should

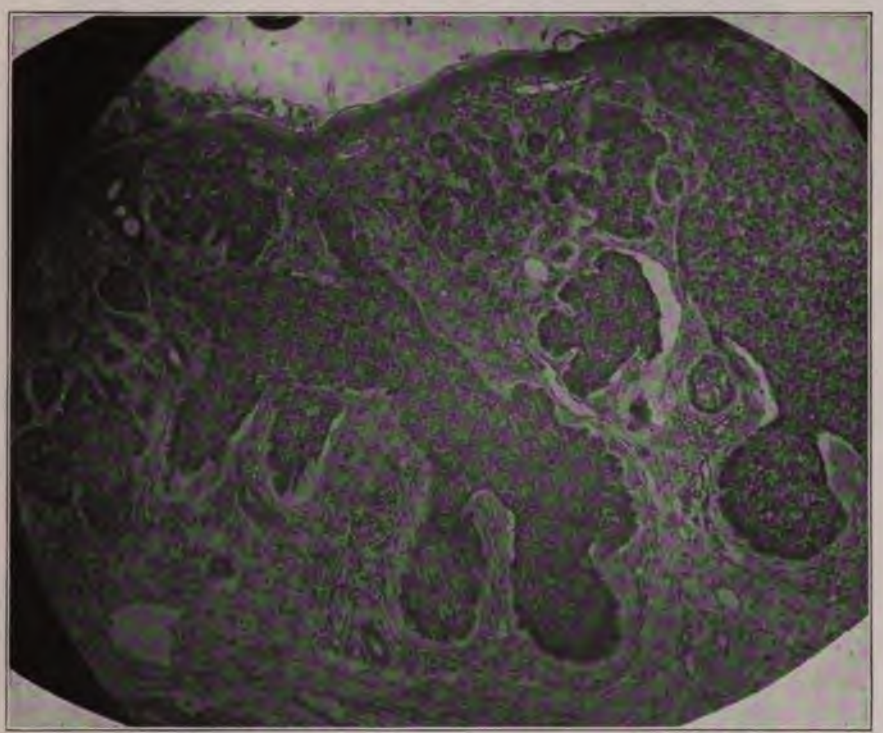

Fig. 504.—Basal-celled carcinoma of the skin, showing characteristic epidermal changes. Low magnification.

serve to distinguish the growths from those of the squamous-celled variety. The consistence of the tumors and the absence of "apple-butter-like" nodules should serve to exclude lupus vulgaris. The lesions may bear a superficial resemblance to serpiginous syphilides, but here, too, the hard, shiny character of the nodules should serve for recognition, and the absence of pigment in the scars also is suggestive of a disorder other than lues.

Prognosis.—The outlook in this variety of cancer is more favorable than in any other form of malignant growth. If neglected, however, the malady may give rise to great deformity, particularly if the nose or the eyelid be the part involved.

Treatment.—The lesions generally respond favorably and promptly to treatment. The smaller growths may be curetted out, and acid nitrate of mercury applied, as recommended by Sherwell, or the x-

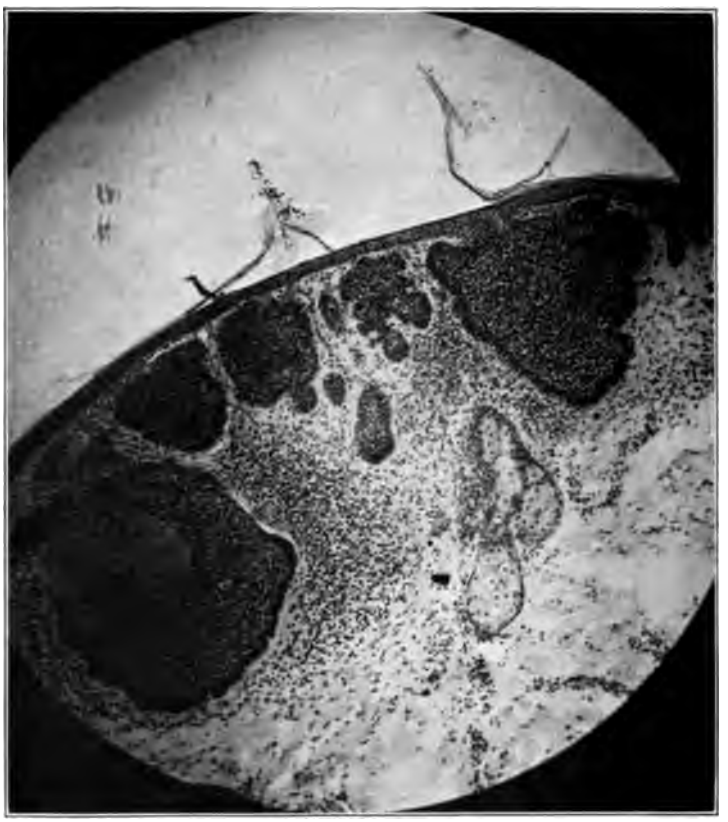

Fig. 505.—Basal-celled carcinoma of skin. The largest of the epithelial masses has undergone central necrosis. Moderate magnification.

rays or radium may be employed. Sweitzer, Engman and Kimbrough, and others have found radium a valuable agent in the destruction of the growths; and after an experience covering five years and several hundred cases, I can add my recommendation to theirs. Angle has recommended the vigorous use of the curette in these cases, followed by the application of a saturated aqueous solution of zinc chloride.

The method has proved a satisfactory one in my hands, and is particularly valuable in those instances in which there is more or less oozing or hemorrhage. Howard Morrow recommends thorough curettage, followed by the application of chromic acid crystals. The acid should be pure, and the crystals red in color. The agent is left in contact with the part until the slough separates, and as a rule no further treatment is required. Under any circumstances, care should be taken to remove or destroy every vestige of the growth at the earliest possible moment.

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BOWEN'S DISEASE.

Synonym.—La dermatose précancéreuse de Bowen, dyskératose lenticulaire et en plaques (Darier).

In 1912, Bowen described under the title of "Precancerous Dermatoses" two cases of atypical epithelial proliferation which were characterized by the development of firm, pinkish or reddish papules which were covered with a thickened horny layer and which tended to form rounded, nodular lesions. In some instances the little tumors remained discrete, in others they tended to become grouped or confluent. Crusting was not infrequent, and when the surface débris was removed, the skin beneath was found to be red and oozing, granular, and sometimes papillomatous in appearance. Histologically, the lesions in some respects resembled those of Paget's disease. Excision, or complete destruction of the lesions appeared to be the only successful method of treatment. Similar cases have been described by Darier.

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PAGET'S DISEASE.

Synonyms.—Paget's disease of the nipple; Eczema epitheliomatosum; Malignant papillary dermatitis.

Definition.—A rare eczematoid affection which usually involves

the nipple region in women, and which ultimately terminates. in malignancy.

Symptoms.—The disorder was first described by Paget, of London, in 1874. All of Paget's original cases occurred in women, between the ages of forty and sixty, but the reports of later observers (Crocker, Pick, Davis, and others) show that males also are sometimes attacked, and that the disease is not always confined to the mammary region. The malady commences insidiously as a sharply circumscribed, eczematous inflammation of the nipple and immediately contiguous areola, a condition which Paget has compared to that occurring in an acute balanitis. There may be slight scaling at first. Later, as a result of the presence of a sticky, viscid fluid which is exuded, there is more or less crusting. Itching is an early symptom, and pain

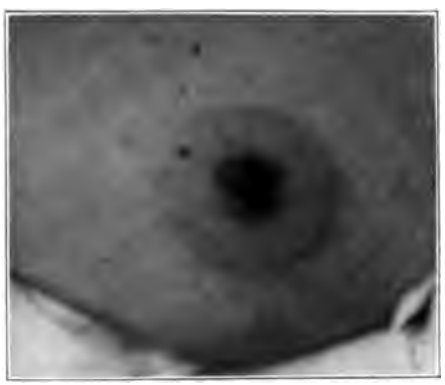

Fig. 506.—Early stage of Paget's disease.

is frequently present. The lesions do not respond to antieczematous treatment, and never heal spontaneously. The affected plaque is sharply defined, and densely infiltrated. The process gradually extends peripherally until an area 20 cm. or more in diameter, or even the entire breast is involved. The nipple becomes retracted, and fissuring and erosion occur. Sooner or later, in from one or two to several years, a superficial ulcerating, or a deep, nodular carcinoma develops, and ultimately the entire breast may be affected. As a result of lymphnode involvement, the contiguous axilla also may be invaded. In rare instances both breasts have been involved. In the extramammary cases, the penis, scrotum, perineum, pubes, umbilicus, lip, nose, forearms, and trunk have been some of the regions attacked.

Etiology and Pathology.—The majority of the patients are middle-

aged or elderly women who have borne children. The right breast is affected more frequently than the left. The exciting cause is unknown. The connection between the eczematous disorder and the carcinomatous condition which succeeds it has not been definitely

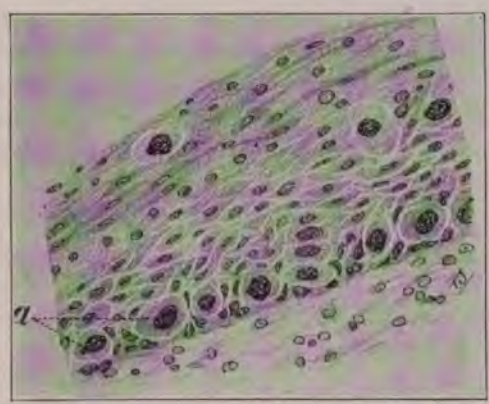

Fig. 507.—Paget's disease, showing characteristic cells. (Courtesy of Dr. Arthur E. Hertzler.)

Fig. 508.—Paget's disease of the nipple, advanced stage. (Courtesy of Dr. H. C. Baum.)

settled. Some authorities hold that the dermatitis is primary and the carcinoma secondary. Others believe the reverse to be true. The arguments pro and con have been admirably summarized by Hertzler; "In favor of the primary nature of the skin affection may be mentioned: (1) the disease may exist many years before a carcinoma can

be demonstrated; (2) similar lesions are found on the penis, scrotum, vulva, and umbilicus; (3) the presence of peculiar cells (Paget's cells) in the epidermis; (4) the apparent direct continuation of the epidermal cells into the carcinoma. In opposition to the primary nature of the affection is, (1) the demonstration of the early involvement of the cells lining the ducts; (2) the tumors when first discovered are deep and may retain a gland-like contour; (4) the Paget's cells may result from metamorphosis of epidermal cells from the deeply lying carcinoma; (5) eczema of the nipple may exist without the development of carcinoma." Paget's cells are large, sharply defined, uninucleated cells with deeply staining nuclei, and a retracted, faintly staining protoplasm. Their presence is pathognomonic of the malady.

Prognosis and Treatment.—In the early cases the outlook, under proper treatment, is good. In extensive and advanced cases, the prognosis is practically the same as that of carcinoma of the breast. Hartzell, Simpson, Fordyce, and others have reported encouraging results following the employment of the x-rays and of radium. In the majority of instances, however, early and radical excision constitutes the best and safest plan.

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SARCOMA CUTIS.

Synonyms.—Sarcoma of the skin; Sarcomatosis cutis.

Definition.—A sarcoma is a malignant tumor formed of immature connective tissue.

In some instances the growths are composed of an admixture of tissue which sufficiently approaches that of the adult type to permit of recognition, and to these, according to the type of tissue present, the terms angiosarcoma, fibrosarcoma, and similar terms are applied.

One of the best classifications of the cutaneous sarcomata is that suggested by de Amicis. This investigator maintains that there are three types of sarcoma of the skin: (1) cutaneous sarcoma, devoid of pigment, and occurring at one spot, or in multiple foci; (2) cutaneous melanotic sarcoma; (3) cutaneous multiple sarcoma, pigmented or hemorrhagic in character.

Localized Non-pigmented Sarcoma.—This is the most benign variety, and is characterized by the occurrence of a single or localized round or oval, pea- to lemon-sized, pinkish, reddish or purplish tumor which commonly develops on some pre-existing lesion of the skin, such as a wart, or nævus, or at the site of an injury. The growth may be slightly or considerably elevated above the general level of the skin, either as a diffuse, infiltrated tumor, or as a mushroom-like or pedunculated mass. The lesions are usually soft and compressible or even pulsatile, their consistency varying with the amount of vascular tissue present.

Fig. 509.—Sarcoma of face. (Courtesy of Dr. Otto Leslie Castle.)

The malady may develop at any age, and affects both sexes. Joseph Zeisler and E. P. Zeisler have reported an unusual, but histologically typical, case in a young woman.

Multiple, or Generalized, Non-pigmented Sarcoma.—In this form the growths, which are round or oval, pinhead- to egg-sized, pinkish or bluish tumors, vary in number from a few to several hundred. The lesions may develop following the appearance of a single primary growth, or several or more may appear simultaneously without premonition. The tumors of this type are of firmer consistence than those of the localized variety. The overlying epidermis is smooth and shiny, and telangiectases are frequently present. Ulceration is

Fig. 510.—Localized, non-pigmented sarcoma of neck, showing result of heavy x-ray therapy. (Courtesy of Dr. W. L. Brosius.)

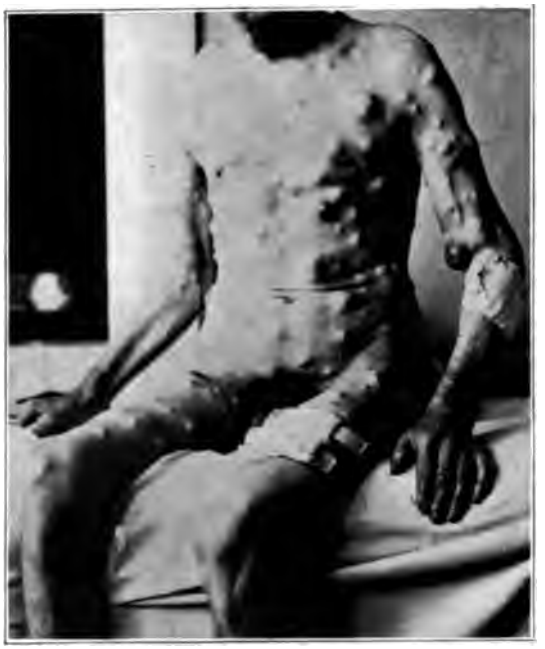

Fig. 511.—Generalized, non-pigmentary sarcomatosis. An unusual example. (Courtesy of Dr. Alfred Schalek.)

not uncommon. The exact relationship of this variety of sarcoma to mycosis fungoides and to certain types of lymphodermia is yet to be fully investigated. Both clinically and histologically, the three conditions have many characteristics in common.

Melanotic Sarcoma (Melanoma).—This is the most malignant of

Fig. 512.—Melanotic sarcoma. (Courtesy of Dr. Howard Fox.)

the sarcomata. The growths usually, but not invariably, start in a choroid or pigmentary nævus. Unlike the tumors of the pigmented hemorrhagic type, the coloring matter is derived from the melanin in these pre-existing lesions, and not from the blood pigment. The result of recent investigations would indicate that the majority of

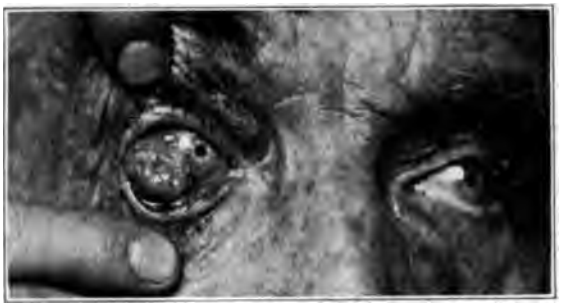

Fig. 513.—Melanotic sarcoma of eye. (Courtesy of Dr. O. L. Castle.)

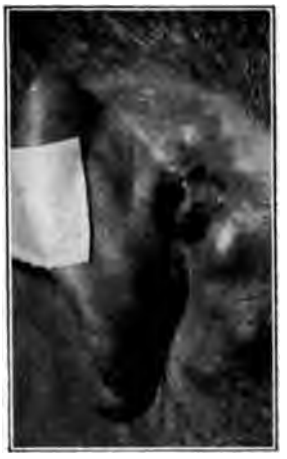

Fig. 514.—Pigmented sarcoma arising from nævus. (Courtesy of Dr. Jabez N. Jackson.)

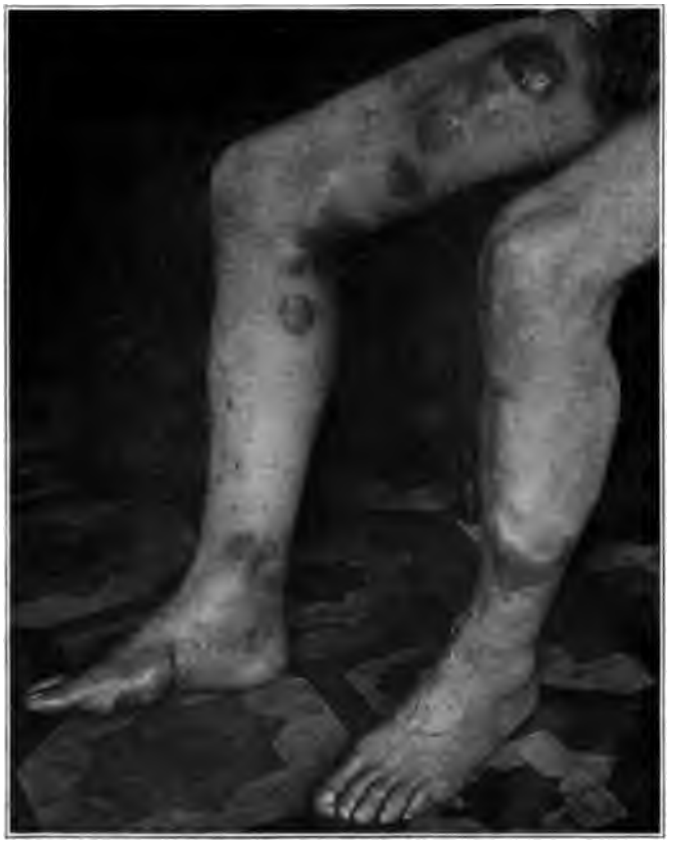

Fig. 515.—Multiple, non-pigmented sarcoma. Rapidly fatal. (Courtesy of Dr. E. J. Angle.)

melanotic growths are carcinomatous rather than sarcomatous in nature, and Fordyce suggests the term "melanoma" as a more appropriate one than the titles that have heretofore been employed. In addition to their intense malignancy, and the presence of melanotic pigment, the growths are characterized by rapid development and a tendency to regional and general metastasis. The disseminated cu-

Fig. 516.—Melanotic sarcoma, involving trunk, face and limbs. (Courtesy of Dr. John W. Perkins.)

taneous lesions are pinhead- to egg-sized, of moderately firm consistence, and brownish or blackish in color. In shape they are ovoid or spherical, and slightly or considerably elevated. The sites of predilection are the face and the extremities, particularly the plantar surface of the feet. Occasionally, as in the "melanotic whitlow" of Hutchinson, the process may first become apparent around the border

of the nail. The course of the disease generally is rapid. Melanin can be found in both the secondary growths and in the affected lymph-nodes, and may also be present in the blood and urine.

Multiple Hemorrhagic Sarcoma (Idiopathic Multiple Pigmented Sarcoma of Kaposi).—From the standpoint of malignancy, this variety occupies a position about midway between the generalized non-pigmented growths and those of the melanotic type. The majority of the reported cases have occurred in adult males. Several or more lesions usually develop simultaneously, the limbs being the sites of

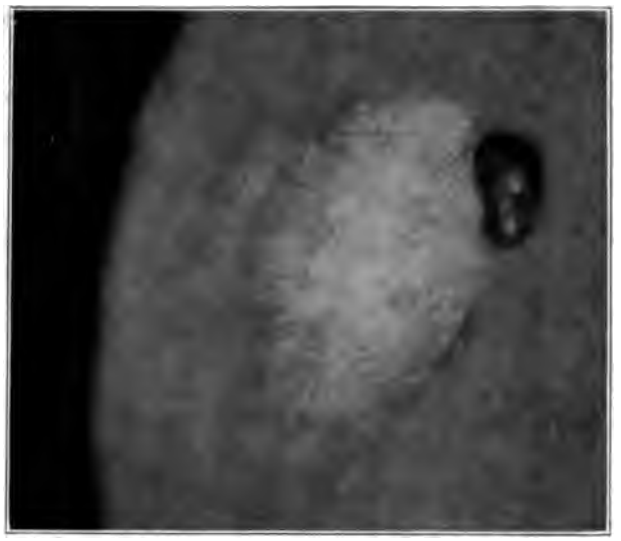

Fig. 517.—Recurring melanotic sarcoma. The new growth is located at the margin of the old scar. (Courtesy of Dr. Bruno L. Sulzbacher.)

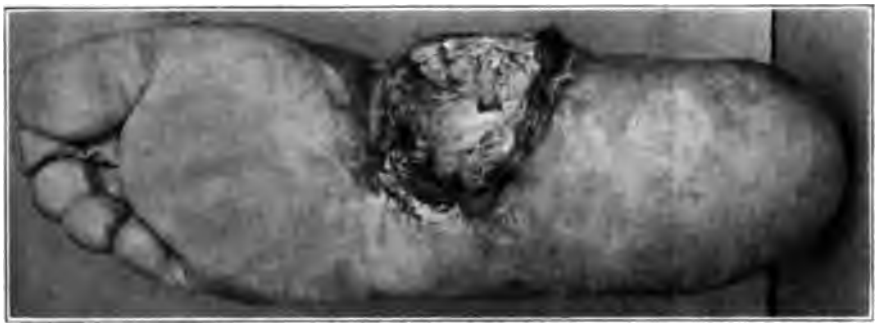

Fig. 518.—Melanotic sarcoma of foot. (Courtesy of Dr. Otto Leslie Castle.)

predilection. The earlier manifestations may take the form of ill-defined, doughy, infiltrated areas, or of collections of several or more firm, bean- to pea-sized, reddish or purplish nodules, often with accompanying telangiectases. The course of these lesions is erratic.

Fig. 519.—Melanotic sarcoma of heel. (Courtesy of Dr. Howard Morrow.)

Fig. 520.—Melanotic sarcoma. (Courtesy of Dr. Howard Fox.)

They may persist unchanged for months, or they may ulcerate, or disappear spontaneously. New growths are constantly springing up, however, and in the course of a few months the involved parts, especially the legs, become greatly increased in size, the skin being

rugous and nodular, and bluish or purplish in hue. The duration of the disease is from two to twenty years. It often terminates fatally. Spontaneous involution with complete recovery has been noted in a few instances. Arsenic has apparently proved curative in a considerable percentage of cases, but, as G. H. Fox and Wile have suggested, it is probable that many, if not all of these were examples of sarcoid (q.v.). Cole and Crump's case was complicated with leukemia.

Etiology.—Trauma, irritation, and certain other predisposing fac-

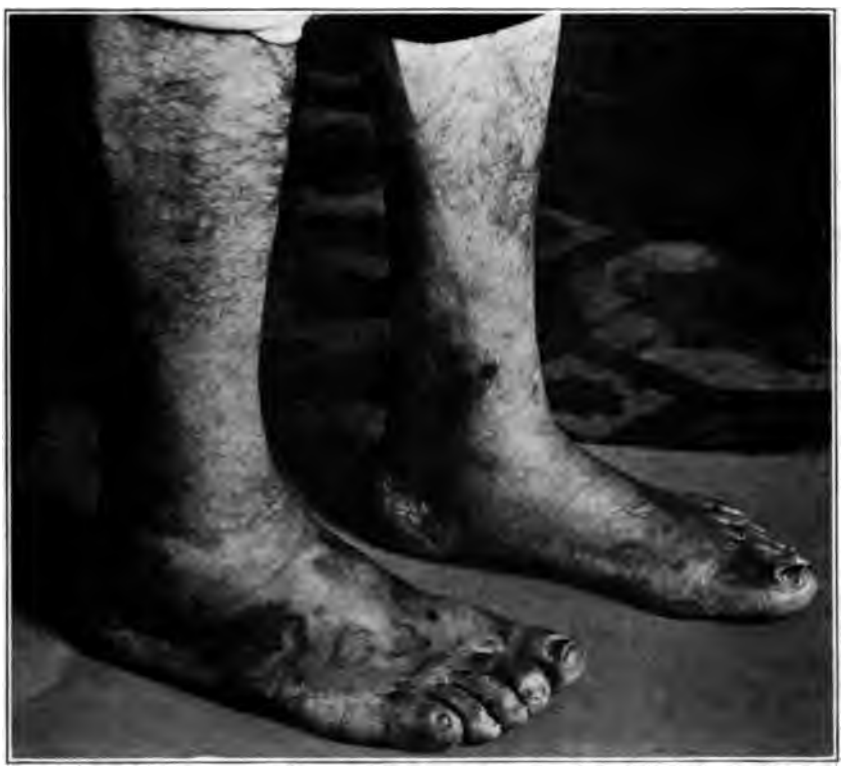

Fig. 521.—Hemorrhagic sarcoma of Kaposi. Three years' duration. (Courtesy of Dr. E. J. Angle.)

tors are recognized, but of the essential cause of sarcoma we know nothing.

Pathology.—In non-pigmented sarcomata the growths may be of the small or large round-celled, the spindle-celled or mixed variety.

The small round-celled are the most malignant, and the mixed, and tumors approaching the adult type of tissue (such as fibrosarcomata),

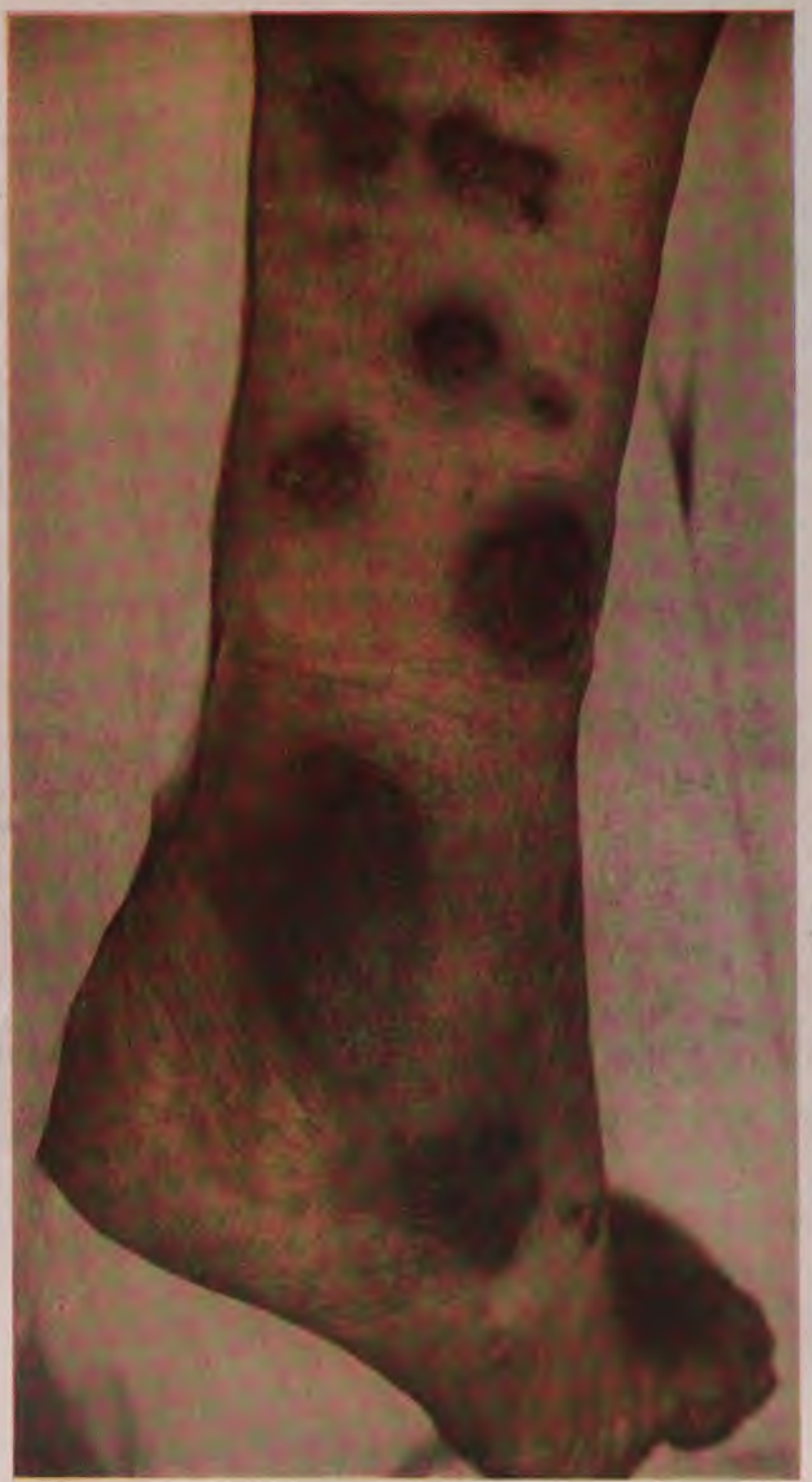

PLATE VII.

Hemorrhagic Sarcoma of Kaposi. (Courtesy of Dr. M. L. Heidingsfeld.)

Fig. 522.—Hemorrhagic sarcoma of Kaposi. (Courtesy of Dr. Howard Fox.)

Fig. 523.

Fig. 523.—Hemorrhagic sarcoma of the skin, Kaposi. (Courtesy of Dr. Fred Wise.)

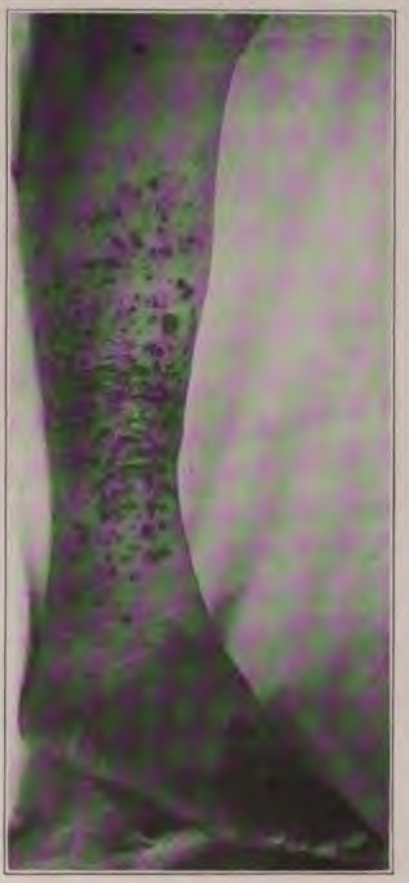

Fig. 524.

Fig. 524.—Hemorrhagic sarcoma of Kaposi. (Courtesy of Dr. Howard Fox.)

least so. The exact point of origin in melanotic sarcoma is not definitely known. Von Recklinghausen held that the growths originated in the lymphatic endothelium, and the views of Johnston, who concludes that the majority arise from soft nævi (which are probably endotheliomata of lymph vessel origin) tend to uphold this theory. Johnston believes that nævi melanomata whose histogenesis it is not

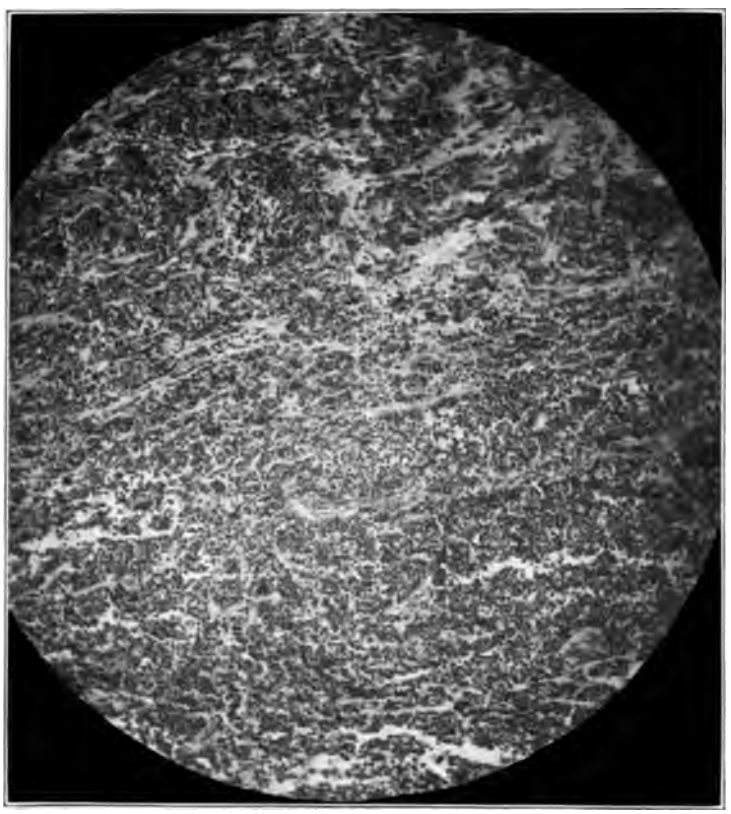

Fig. 525.—Melanotic sarcoma. Moderate magnification. (Courtesy of Dr. Leslie B. Miller.)

possible to determine must be referred to the same origin. The process of pigment formation is not fully understood. Meirowsky believes that the chromatophores contain an enzyme which is capable of oxidizing certain aromatic substances with resulting formation of pigment. Neuberg has succeeded in producing melanin artificially by adding adrenalin to the colorless extract of melanoma (Hertzler and Gibson). The tumors vary somewhat in structure, and may consist

mainly of either round or spindle cells, but all contain considerable quantities of melanin, the pigment being irregularly distributed through the cellular portions of the growth.

In the cases of multiple pigmented (hemorrhagic) sarcoma originally studied by Kaposi, the lesions were round-celled sarcomata. The pigmentary changes are a result of the disintegration of blood, following capillary hemorrhage. Both Fordyce and Wende found the growths to consist mainly of spindle cells (cross-sections of which bore a striking resemblance to round cells). Favera also found spindle-cell infiltration which he thought was either related to the capillary new-formation or of endothelial origin. Gilchrist and Ketron, in their exhaustive study of the disorder, found that the lesions began in the skin as angiomata, due to proliferation and dilatation of the blood capillaries, which are very frail at first and liable to rupture. This was followed by a proliferation of the interstitial connective tissue and endothelium, which gradually obliterates the blood spaces, forming solid tumors. In the early stages these resemble, in some areas, young connective tissue, in others, sarcomata. As the lesions grow older they assume a more fibrous aspect, and may undergo involution. Co-existent with the formation of the tumors there is a sclerosis of the small arteries supplying them, causing a gradual decrease in the supply of blood. To this is due, most likely, their later evolution as well as involution.

Diagnosis.—The history and course of the disease, together with the character and distribution of the lesions, are usually distinctive. Fibroma, syphilis, and granuloma fungoides must be excluded.

Prognosis and Treatment.—In the localized, non-pigmented variety early operation is usually followed by recovery. In the generalized types the outlook is more serious. The melanotic form is almost invariably fatal. In multiple pigmented (hemorrhagic) sarcoma the growths occasionally undergo spontaneous involution, and in several instances recovery has followed hypodermatic injections of arsenic (Fowler's solution, sodium arsenate, and sodium cacodylate). The x-rays sometimes prove helpful, and radium is an extremely valuable agent in some instances. In a case reported by MacKee and Remer, marked improvement, with great lessening of pain, followed the use of x-rays (3 skin units—12 Holzknecht, through 3 mm. of aluminum). Coley's serum (which consists of the mixed toxins of Fehleisen's streptococcus and the bacillus prodigiosus) may be tried in the melanotic and other hopeless cases, but the agent is a dangerous and painful one, and care should be exercised in its use.

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LEUKEMIA CUTIS.

The cutaneous and subcutaneous changes occurring in leukemia are a result of the generalized hyperplasia in both the hematopoietic and myeloid tissues. Arndt has suggested that the old terms lymphatic and myeloid leukemia be replaced by aleukemic, subleukemic, and leukemic lymphadenosis, and myelosis. In the aleukemic form the white count is normal, in the subleukemic form the total white count is normal or very little increased, but the proportion of lymphocytes is augmented, and in the leukemic form there is an absolute, permanent, progressive increase of lymphocytes, and the total white count is increased. The skin lesions may be clinically indistinguishable from those occurring in other cutaneous disorders (purpura, prurigo, etc.), or they may be typically lymphadenotic in character. To the former, Audry has given the name of "leucemids." The skin manifestations may be practically identical with those of purpura (with or without bullae formation, as described by Shattuck, and involving the mucous membranes as well as the skin, and sometimes terminating in necrosis and ulceration), pruritus, prurigo or pityriasis rubra. While the lesions in prurigo lymphatica morphologically resemble those in the prurigo of Hebra, the localization is not typical, and the disorder may develop at any age. In the majority of instances, however, a positive conclusion regarding the diagnosis can be reached only by means of a histologic examination.

True lymphadenosis of the skin may be universal or circumscribed. Universal lymphadenosis due to myelosis (myeloid leukemia) is unknown, but examples of the circumscribed form (characterized by the presence of leucocytes, myeloblasts, giant cells, and nucleated red

cells) have been described by Hindenburg and Brunsgaard. Universal lymphadenosis due to lymphatic leukemia is also a rare disorder, and is occasionally confused with the so-called pre-mycosic dermatitis (the érythrodermie prémycosique of the French). The circumscribed form is the least rare and the most typical of all the three forms of lymphatic leukemia. The lesions may consist of macular or slightly elevated patches, or of oval-topped, pea- to orange-sized

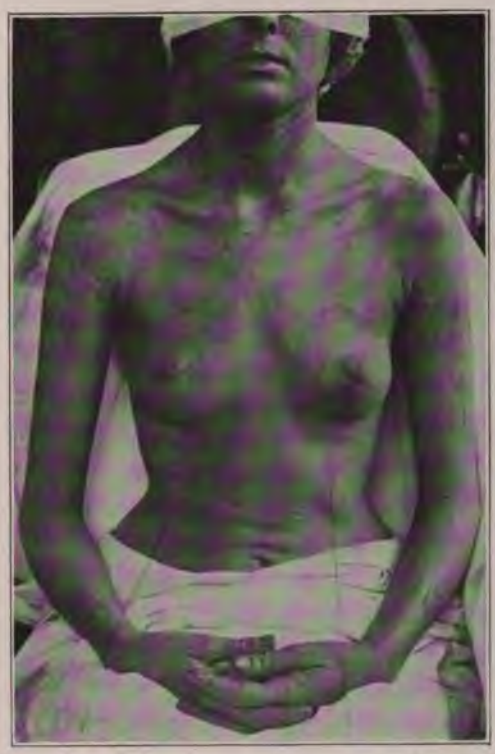

Fig. 526.—Leukemia cutis. (Courtesy of Dr. William Allen Pusey.)

Fig. 527.—Leukemia cutis, showing nodules on abdomen and thighs. Leucocyte count was at first 52,000, later rose to 121,000. (Courtesy of Dr. Lindsay S. Milne.)

tumors which tend to coalesce and become lobulated. The tumors are yellowish-brown or brownish-red in color, and are rather firm but elastic to the touch. The sites of predilection are the face, especially the nose, eyelids, lips, and ears, and the extremities, particularly the backs of the hands. Occasionally the distribution is more or less

general. The mucous membranes are seldom involved. Subjective symptoms are absent. The lesions develop rapidly, and after attaining a certain size may persist unchanged for months or years. They rarely ulcerate, and when spontaneous regression occurs scarring never results. Schweitzer has recently reported an extremely interesting case of leukemia cutis in which the blood findings were normal throughout, but the histologic picture absolutely typical.

Etiology and Pathology.—The essential cause of the lymphatic hy-

Fig. 528.—Leukemia cutis. (Courtesy of Dr. S. E. Sweitzer.)

perplasias is unknown. Histologically, Arndt found the lesions to consist of a pure, lymphocytic infiltration of the skin and the subcutaneous tissue, stopping with a very sharp line just beneath the papillary layer. The epithelium (normal or flattened) was always separated from the tumor-like infiltration by a narrow, somewhat edematous zone, in which could be detected a few newly formed cells. The elastic tissue had been destroyed in the center of the large tumors. In the smaller patches, it may be rather well preserved.

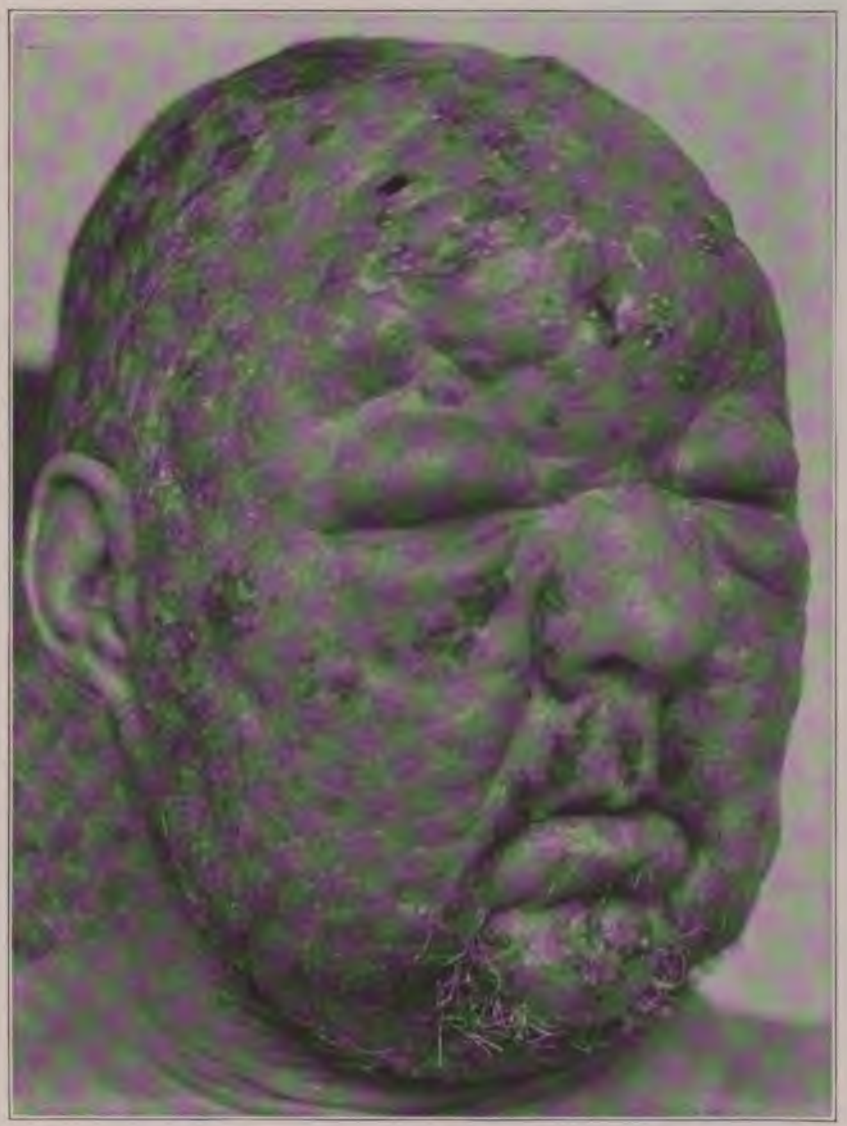

Fig. 529.—Leukemia cutis. (Courtesy of Dr. Grover W. Wende.)

In the large tumors no follicles, sebaceous glands or sweat glands were to be observed. In the smaller patches the process very often starts in the neighborhood of the hair follicles, the sebaceous glands and sweat coils, although these structures are usually well preserved. This perifollicular, periglandular localization is due to the fact that the follicles and glands are surrounded by a very well-developed system of capillaries.

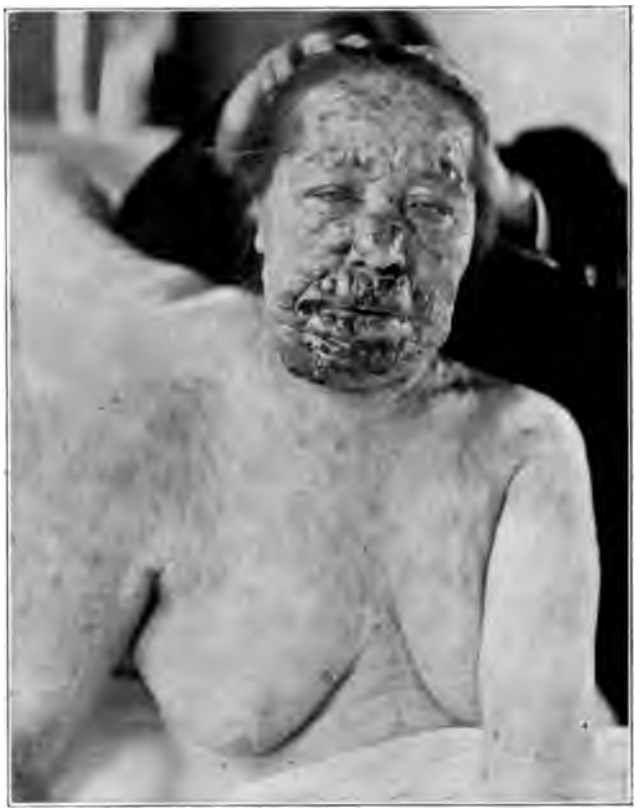

Fig. 530.—Leukemia cutis. (Courtesy of Dr. Frederick G. Harris.)

At the first glance, with the ordinary stains, it appears as though there is only one cell-form, small, more or less round element, with a very narrow border of protoplasm or without protoplasm, and a dark-stained nucleus showing sometimes a sort of wheel structure. When certain stains (polychrome methylene blue, methyl green, pyronine and a combination of Much, Grünwald and Gram), are em-

Fig. 531.—Leukemia, with nodular infiltration of the skin. (Courtesy of Dr. Grover W. Wende.)

ployed, however, one is able to differentiate between the different forms of cells.

Most of the infiltrating cells are of the type of the so-called small lymphocytes of the lymphnodes, but there are also irregularly scattered lymphoblasts and lymphoblastic plasma cells (cells with a large, pale, round- or kidney-shaped, lobulated nucleus, two or more very

Fig. 532.—Leukemia cutis. Low magnification.

distinct nucleoli, and a narrow border of protoplasm which takes the pyronine more or less intensely). At the periphery there are some proliferated connective-tissue cells.

Lymphocytic plasma cells are absent in the majority of instances, but occasionally they may be present in considerable numbers. Mitoses are very rare.

Diagnosis.—The recognition of leukemic eruptions of the skin is often dependent upon the discovery of the underlying cause. The simplest and easiest method of doing this is by a microscopic examination of an excised lesion in every suspected case, irrespective of the blood findings.

Treatment.—The best results have followed the administration of benzol internally, and of arsenic internally or hypodermatically. Arsphenamine, preferably in small, oft-repeated doses, has proved beneficial in a few instances. In the chronic cases radiotherapy (over the long bones) may prove helpful.

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PSEUDOLEUKEMIA CUTIS.

Pseudoleukemia, or Hodgkin's disease, may give rise to skin lesions, particularly papules and nodules, clinically indistinguishable from those of leukemia cutis. Cole has thoroughly reviewed the literature, and collected a number of reported cases of pruritus in Hodgkin's disease. Block has described a bullous eruption occurring during the course of the disease, and Bowen two cases in which the nodules closely resembled those of Hebra's prurigo. In a case reported by Radaeli the diagnosis lay between Hodgkin's disease and granuloma fungoides. The results of the recent studies of Bunting and Yates, and of Billings and Rosenow, and the discovery of the causative organism of pseudoleukemia, will do much to stimulate further investigative work in this disorder, as well as to supply us with a vaccine which may prove helpful in combating the affection.

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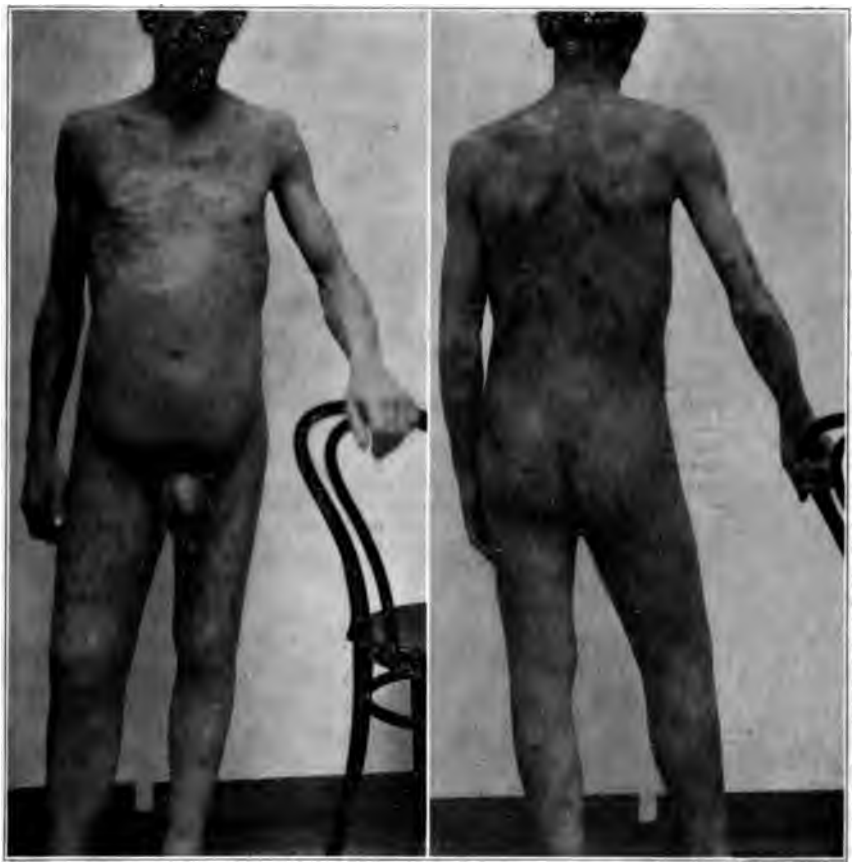

Fig. 533. Fig. 534.

Figs. 533 and 534.—Pseudoleukemia with skin manifestations. Note enlargement of inguinal lymphnodes.
(Courtesy of Dr. Harold N. Cole.)

GRANULOMA PYOGENICUM.

Synonyms.—Botryomycosis hominis; Pseudo-botryomycosis hominis; Granuloma telangiectodes; Granuloma pediculatum.

Definition.—A small pedunculated granuloma, which develops at the site of an injury, and is probably a result of infection with the yellow staphylococcus. The disorder was first described by Poncet and Dor in 1897. These authorities believed the disorder to be identical with the so-called "botryomycosis" of horses. In 1902 Bodin proved conclusively that the bodies which had previously been known

as "botryomycetes" were but clumps of staphylococci, and since that time the disorder has been known in France as "pseudo-botryomycosis hominis." Hartzell, Crocker and others have suggested the appropriate and euphonious designation of "granuloma pyogenicum" for the disorder, and, in English-speaking countries at least, this name has met with general approval.

Fig. 535.—Granuloma pyogenicum of lip.

Fig. 536.—Granuloma pyogenicum of hand.

Symptoms.—The lesions are pinhead- to cherry-sized, rounded or oval, reddish or purplish, pedunculated, mushroom-like tumors. They usually spring up at the site of some slight abrasion or injury, or at the margin of a wound. They are generally painless, but are tender and bleed profusely on slight provocation. As Brocq has stated, the little growths develop oftenest on parts exposed to

trauma, the hands and feet being the sites of predilection. I have several times encountered them on the lips. The "vaccination area" on the left arm is another favorite location. In one of Wile's cases

Fig. 537.—Granuloma pyogenicum of lip.

Fig. 538. Granuloma pyogenicum of arm.

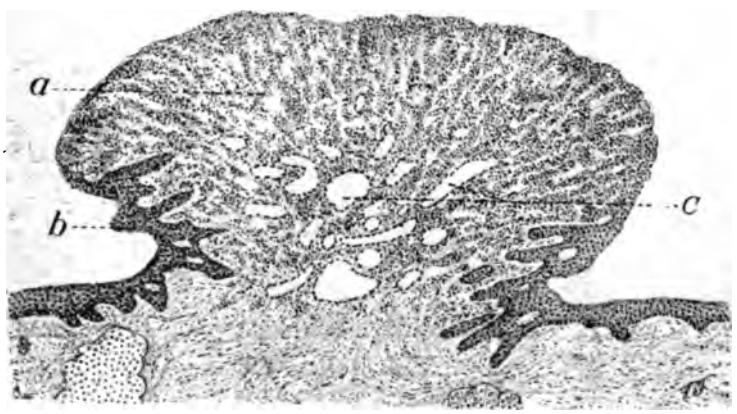

Fig. 539.—Granuloma pyogenicum. *a*, body of tumor; *b*, epidermis projecting upward on side of tumor; *c*, newly formed blood vessel in center of mass. Slight magnification. (Courtesy of Dr. Arthur E. Hertzler.)

the umbilical region was attacked, and in one of C. J. White's patients the lesion developed under the free end of a finger nail.

The tumors develop quickly, in the course of a few hours or days,

and after attaining their full size persist for weeks or months unchanged. If clipped off, they promptly recur. This tendency to relapse is so marked a feature that on two occasions cases of granuloma pyogenicum have been referred to me with a probable diagnosis of sarcoma. The surface of the tumors is smooth and moist, and more or less crusting may be present.

Etiology and Pathology.—The disorder is in many respects identical with granulation tissue ("proud flesh"), and is very probably

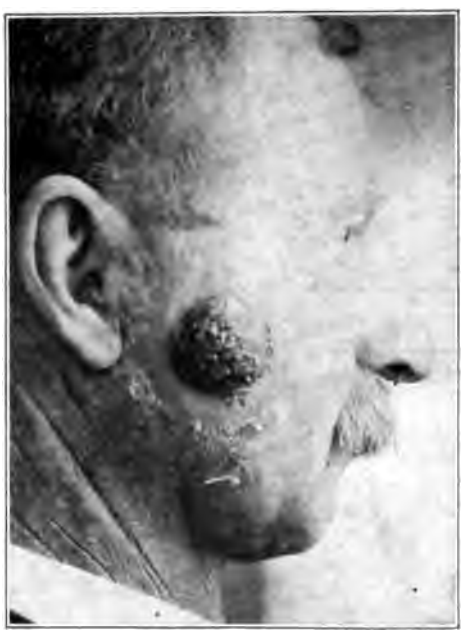

Fig. 540.—Granuloma pyogenicum of unusual type. Lesion 5 cm. in diameter, and painless, with sharply defined border. Only organism present was the yellow staphylococcus. (Courtesy of Drs. A. P. Biddle and R. A. C. Wollenberg).

due to infection with certain strains of the staphylococcus pyogenes aureus. This organism has repeatedly been recovered in pure culture from the lesions. Owing to the fact that new lesions do not develop as a result of re-inoculation, it is probable that certain local changes in the tissue also are essential. Montgomery and Culver have found that many of their granuloma pyogenicum patients suffered also from high blood pressure, but in eight cases under my own care, only three presented evidence of arterial hypertension. Histologically the tumors are composed of newly formed connective tissue, so permeated with blood vessels that the mass resembles an angioma. There

is widespread infiltration, mainly of connective-tissue cells, with a few intermixed leucocytes, round and plasma cells, and mast cells. Clumps of staphylococci are found scattered through the growth.

Prognosis.—The lesions are harmless, but persistent.

Treatment.—Excision, followed by cauterization, preferably with carbon dioxide snow, is successful in the majority of instances. Radiotherapy has been recommended, but both the x-rays and radium proved useless in one case under my care.

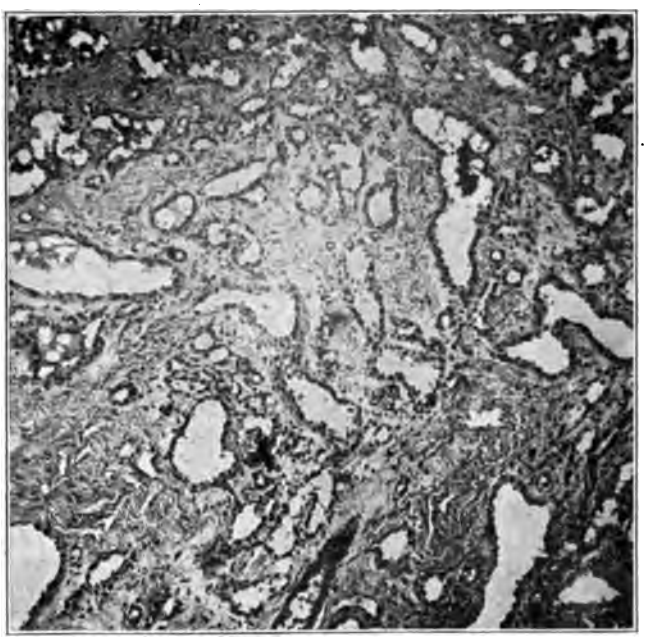

Fig. 541.—Granuloma pyogenicum, showing newly formed vessels and connective tissue. Low magnification.

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GRANULOMA FUNGOIDES.

Synonyms.—Mycosis fungoides; Fibroma fungoides; Lymphodermia perniciosa; Granuloma sarcomatodes.

Definition.—A chronic affection which develops gradually and is characterized at first by lesions of an erythematous, eczematoid, urticarial or mixed type, and later by irregular thickening and infiltration of the skin, with the subsequent formation of nodular growths which frequently ulcerate and form mushroom-like tumors. The malady was first described by Alibert, in 1814. Duhring reported the first case in America.

Fig. 542.—Granuloma fungoides, intermediate stage, tumors just beginning to develop. (Courtesy of Dr. Rollin H. Stevens.)

Fig. 543.—Granuloma fungoides. Complete disappearance of lesions under x-rays. (Courtesy of Dr. E. Wood Ruggles.)

Symptoms.—In the majority of instances the course of the disease is marked by four fairly well-defined stages: (1) The stage of dermatitis; (2) the stage of infiltration; (3) the stage of tumor formation; and (4) the stage of ulceration. In the first stage the manifestations may assume the most variable forms. As Besnier has said, "In the presence of a chronic, ambiguous, pruritic dermatitis, rebel-

lious to the ordinary treatment and which assumes the form of a vague erythrodermia, of a psoriasis, or an eczema, of a rebellious urticaria, of a lichenoid prurigo, etc., it is necessary to bear in mind the question of a possible mycosis fungoides." As a rule, however, the predominating type of eruption is erythematous or eczematoid in character (hence "homme rouge" of the French). This preliminary stage may be brief, or even entirely lacking, the growths developing on

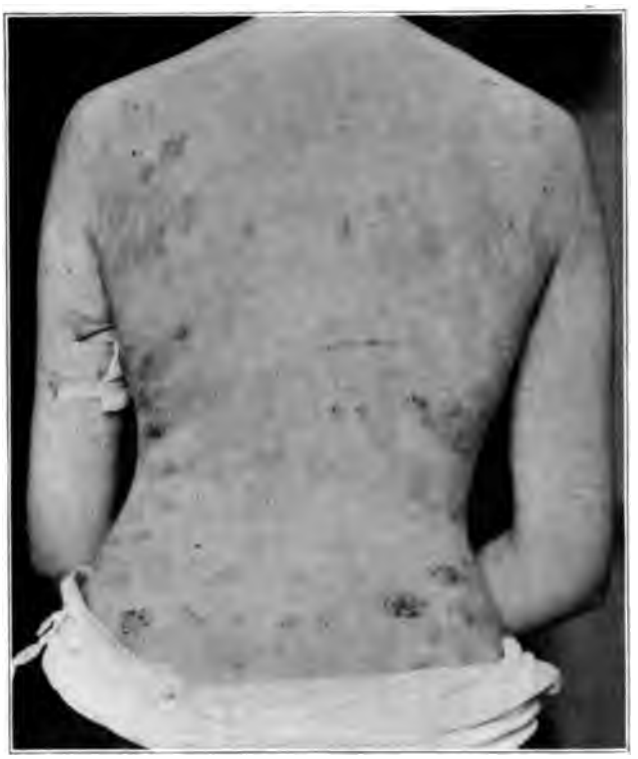

Fig. 544.—Granuloma fungoides, in the pre-mycotic stage. (Courtesy of Dr. Frederick G. Harris.)

apparently normal skin, but usually it is present and may last for months or even years before signs of infiltration become apparent. The patches are usually circinate in outline, and may be either dry or moist. Sevear's case began on the right foot as a pea-sized, subcutaneous nodule with associated pruritus, Biddle's as a generalized, variegated, psoriasiform eruption, and Ormsby's as an efflorescence which could not be differentiated from that of a parapsoriasis. In color the lesions vary from a pinkish or reddish to a purplish or brownish hue. Itching

may be absent but is generally present. These earlier manifestations are as capricious in their course as they are variable in aspect. The eruption may disappear spontaneously at any time only to recur at the same site or in some other locality in the course of a few days or weeks.

In the second stage (the lichenoid period of Bazin), circumscribed areas of infiltration appear. The lesions vary in size from that of a pea to that of the palm, and may be commingled with the erythematous and eczematous plaques of the first stage. They too are oval or circinate in outline, but as a result of involution and of coalescence crescentric and gyrate lesions may be formed. Ulceration sometimes occurs at this stage. The period of tumor formation gradually follows that of infiltration. The growths are round or oval, pea- to orange-sized or larger, whitish, pinkish or purplish, solid, smooth or crusted tumors. Many are pedunculated. In number they vary from a few or several to a score or more. No region is exempt. The course of the tumors varies. They frequently disappear spontaneously, and new ones may spring up on diseased or apparently normal areas at any time. The lesions are seldom tender or painful. They may be itchy, but pruritus is not a prominent feature of this stage of the disease. Ulceration generally occurs first at the apices of the larger growths, and usually only a portion of the tumor is destroyed. The resulting lesion is a mushroom-like, ulcerating mass, the raw

Fig. 545.—Granuloma fungoides, beginning tumor stage.

surface of which is covered with a sanguinous, purulent exudate. Lymphnode involvement may be present, but is not a typical or characteristic feature of the malady.

Etiology.—A small majority of the reported cases have occurred in adult males. Trauma has apparently been a factor in one instance (McNeil, Murray and Atkinson). The disorder is probably microbic

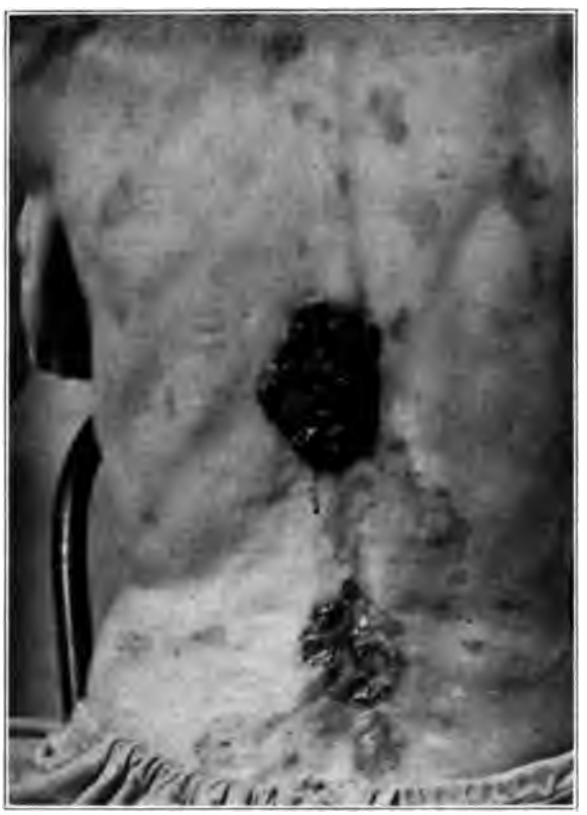

Fig. 546.—Granuloma fungoides of twenty-five years' duration. (Courtesy of Dr. Anstruther Davidson.)

in origin, although careful and exhaustive investigation by competent observers has thus far failed to unearth the causative organism. Strobel and Hazen conclude that mycosis fungoides belongs to a group of myeloid and lymphoid conditions which are closely interrelated, and that these diseases probably have a common exciting cause, possibly a micro-organism, and in this way may be related to the infectious granulomata. White's case in some respects resembled

Hodgkin's disease. There is no characteristic blood-picture, though there is often moderate secondary anemia, varying leucocytosis, and an increase in the mononuclears and eosinophiles.

Fig. 547.—Granuloma fungoides, showing characteristic distribution of lesions. (Courtesy of Dr. E. L. Stewart and Dr. Arthur E. Hertzler.)

Pathology.—In the pre-mycosic stage Galloway and Macleod found connective-tissue cell proliferation around the blood vessels of the subpapillary and papillary layers, the hair follicles, arrectores pili, sebaceous glands, coil ducts and occasionally around the coil glands

as well as in foci independent of these structures situated among the connective-tissue bundles. These cells presented distinct types: (1) Large, oval, fusiform or rounded connective-tissue cells containing granular protoplasm, a large nucleus whose chromatin network

Fig. 548.—Showing characteristic clinical manifestations in an early case of granuloma fungoides. (Courtesy of Dr. Fred Wise.)

and nuclear membranes were darkly stained while the nucleoplasm was more densely stained than the cellular protoplasm unless the cells were undergoing mitosis, when the figures appeared deeply colored. (2) Small, round cells of slightly variable shape, some-

what larger than leucocytes, with nuclei similar to, though proportionately smaller, than those of the large cells. Mast cells of

Fig. 549.—Granuloma fungoides. Early stage of erythematous eruption. (Courtesy of Dr. Grover W. Wende.)

varying size, a few plasma cells, and an occasional giant cell. In the tumor and breaking-down stage the cell proliferation was in-

creased and the cells showed a marked tendency to break down. Both collagen and elastin became basophilic in reaction, and tended to disintegrate. The granuloma encroached on the down-growing epithelium, flattened it out, and eventually spread up to the surface

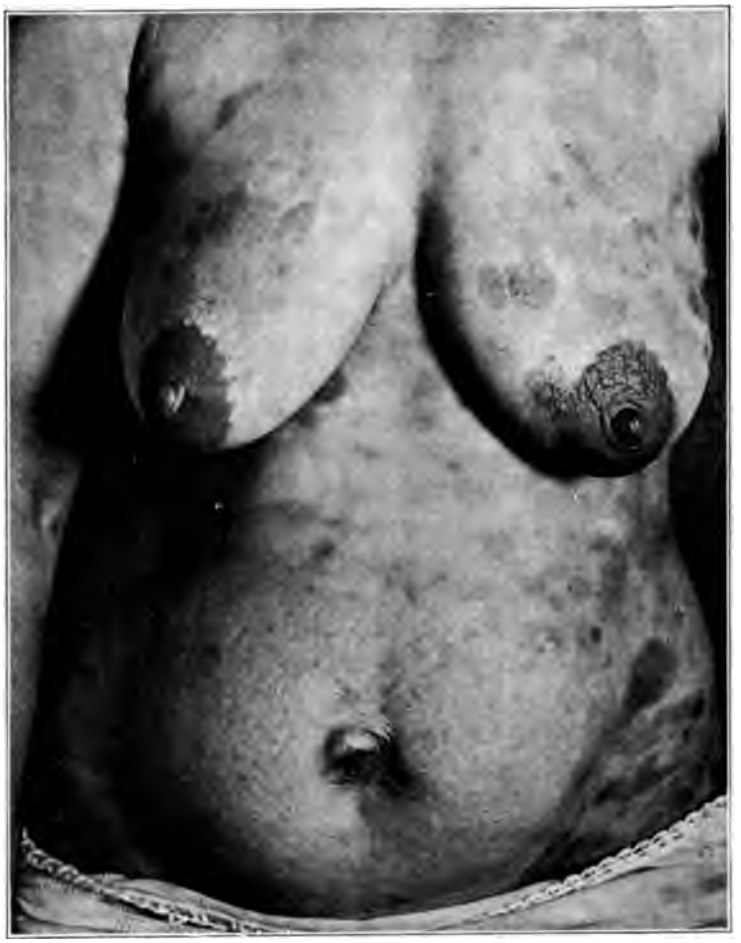

Fig. 550.—Granuloma fungoides, pre-mycotic stage. (Courtesy of Dr. Fred Wise.)

and was only covered by a thin layer of stratum corneum.

Diagnosis.—In its earlier stages granuloma fungoides is to be distinguished from the commoner diseases which it often mimics. Chief among these are eczema, urticaria, psoriasis, and dermatitis exfoliativa. The color, contour and erratic course of the lesions, and their resistance

to ordinary methods of treatment should serve to arouse suspicion. The occurrence of infiltrative changes is a strong point in favor of the more serious disorder. It is only in this stage of the disease that the disorder can be positively differentiated on histologic grounds from some of the ordinary dermatoses, such as psoriasis and parapsoriasis (Fraser). Leprosy and sarcoma may bear some resemblance to granuloma fungoides, but in both of these the history and course

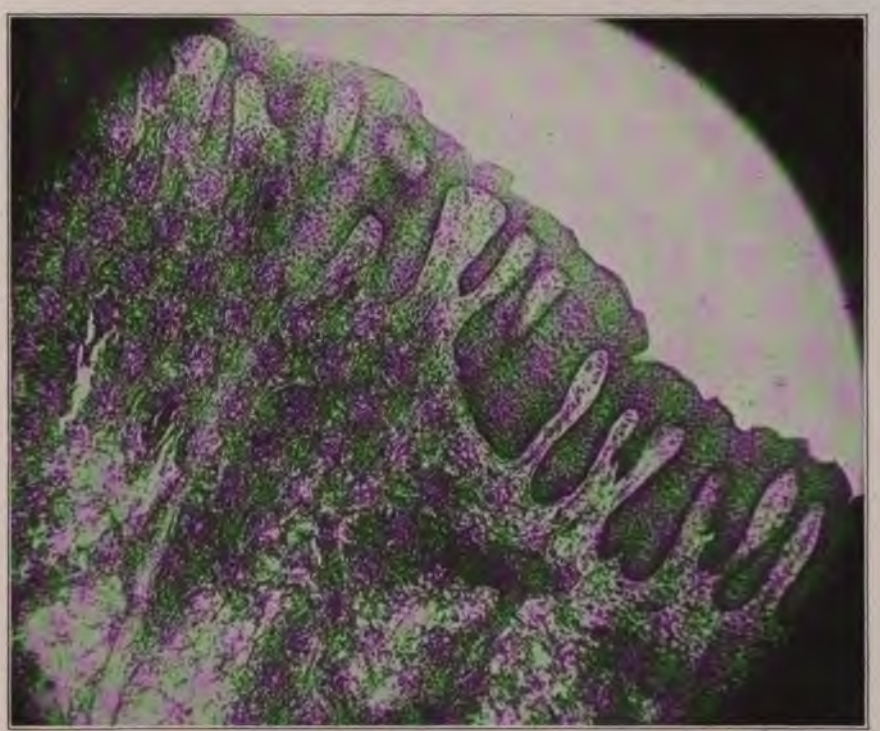

Fig. 551.—Section from a case of granuloma fungoides, showing characteristic cellular infiltration. Moderate magnification.

of the malady, with, if necessary, the biopsy findings, should be sufficient for identification.

Prognosis.—In a few instances recovery has ensued, but the vast majority of cases terminate fatally in from one to ten years.

Treatment.—Of the various methods of treatment suggested, radiotherapy is the most effective and reliable. Of the various internal remedies, arsenic in the form of arsenious acid (Köbner, Geber) and of arsphenamine (Ormsby, Foerster, Fordyce, Kingsbury and others),

and ichthyol (Hodara), have been employed with benefit. Gottheil found injections of Coley's serum helpful. Fordyce has found intravenous injections of typhoid vaccine of value (foreign protein). Locally, soothing applications such as calamine lotion, carron oil, and similar preparations are indicated. In the ulcerative stage mildly antiseptic baths, followed by thymol iodide and similar powders, may

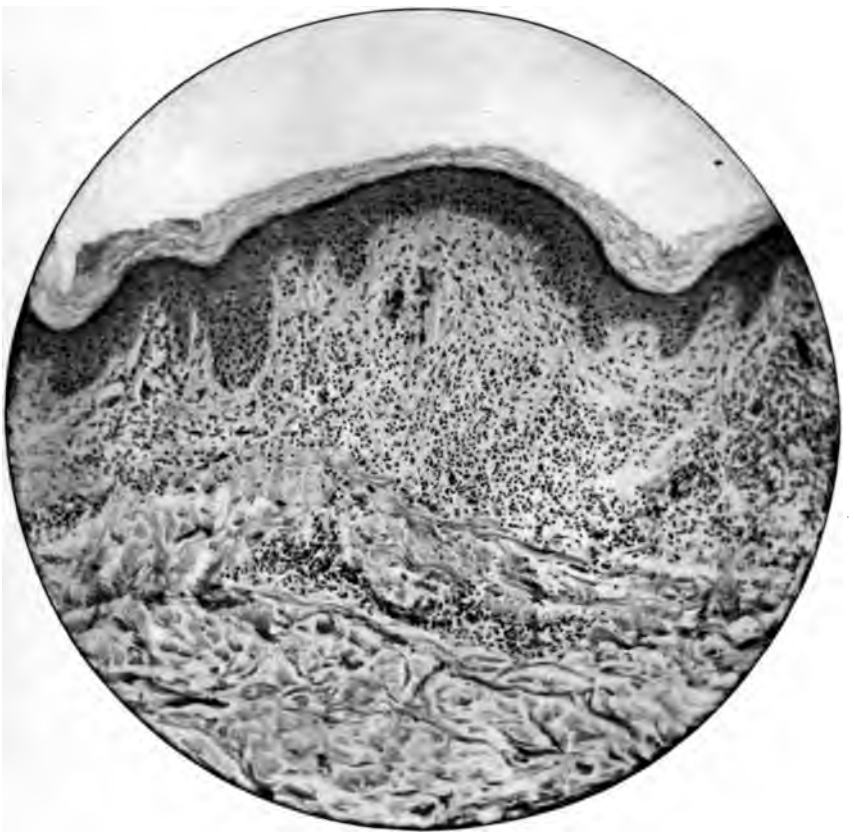

Fig. 552.—Granuloma fungoides, showing characteristic cellular infiltration in an early lesion. Moderate magnification. (Courtesy of Dr. Fred Wise.)

be prescribed. Surgical measures are usually contraindicated, owing to the tendency of the lesions to recur promptly following extirpation, but in selected cases such procedures may be justifiable.

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RHINOSCLEROMA.

Definition.—A chronic granulomatous process which involves the anterior nares and the upper lip, and is characterized by sclerosis of the tissues, with more or less ensuing deformity.

Symptoms.—The disease was first described by Hebra in 1870. The majority of the recorded cases have originated in southeastern Russia, in Egypt, and in Italy. Females are attacked more frequently than males. The poorer classes, and those living under bad hygienic conditions, appear to be more susceptible to the malady than individuals in comfortable circumstances. The disorder generally affects the anterior nares and the upper lip and contiguous structures, but cases have been reported in which the pharynx, larynx, trachea, tongue, and even the lachrymal passages and the lobe of the ear were involved, either primarily or secondarily. The disease begins as one or more hard, insensitive, circumscribed, cartilage-like plaques which are at first subcutaneous but later extend upward into the surface structures. The overlying epidermis gradually assumes a peculiar reddish or brownish, glistening hue and may become scaly and crusted. The superficial capillaries are dilated and congested. In the course of several months or years, the tumors tend to become irregular or lobulated. The surface of the lesions is smooth or slightly wrinkled, and they are firmly imbedded in the skin. Ultimately, involution and shrinkage occur, and the masses diminish in size, and become dense, firm and hard. The nature and degree of the resulting deformity is dependent upon the location of the part affected and the extent of the involvement. In the nasal cases the nostrils are thickened and stiffened, and the tip of the nose is enlarged and elevated. The amount of infiltration may be so great

as to close entirely the lumen of the nostrils. The mobility of the lips may be impaired to such an extent as to interfere with the power of speech. The mucosa of the nose and pharynx becomes puckered and shrunken. In rare instances the gums are involved, and the teeth become loose and may fall out. Ulceration is rare, but may occur as a result of accidental injury or infection. The course of the disease is extremely slow and may extend over a period of many years. There is no granular or lymphnode involvement.

Etiology and Pathology.—It is probable that rhinoscleroma is due to an organism (a short, encapsulated, Gram-negative bacillus) which

Fig. 553.—Rhinoscleroma. (Courtesy of Dr. W. S. Gottheil.)

was isolated by von Frisch, in 1882, and which is morphologically almost identical with the pneumococcus of Friedlander, although the results of animal inoculation experiments have been negative. According to Unna, the tumor-mass consists mainly of large, typical plasma cells, collections of which are irregularly scattered in all the layers of the skin and subcutaneous tissue. The collagenous tissue is thickened and increased at many points in the tumor, and it is to this firm, unyielding fibrous material that the pathognomonic hardness of rhinoscleroma is due. The hair follicles and coil glands become atrophied, but without accompanying signs of inflammation. Of the regressive changes the large oval dropsical cells first de-

scribed by Mikulicz and the hyaline degenerated cells of Pellizari are the most characteristic. Mikulicz's cells are probably degenerated plasma cells. Each cell usually contains a number (6 to 8) of Frisch's organisms. The hyaline degenerated cells are spherical in shape, and, like the dropsical, four or five times the diameter of the surrounding plasma cells.

Diagnosis.—The characteristic localization of the lesions, their hardness, and the absence of ulceration, all are suggestive. Syphilis, carcinoma and keloid are to be excluded.

Prognosis and Treatment.—The disease is steadily progressive, and remarkably stubborn and resistant to treatment. Surgical interference, unless radical, is usually followed by recurrence. Radiotherapy has proved helpful in the hands of Gottheil, Pollitzer, Lieberthal, Smith, and others, and Alderson and Smith have noted improvement following injections of autogenous vaccines.

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TUBERCULOSIS CUTIS.

Tuberculosis of the skin is a much rarer disorder in America than in Great Britain and in Europe. Unfortunately, however, it is far from uncommon in this country, particularly in the more densely populated quarters of the larger cities where the hygienic conditions are bad and the general resisting power of the inhabitants below par. Most of the cutaneous forms of the disease are usually acquired in childhood, and the skin may be involved primarily or secondarily.

True tuberculosis of the skin may be separated into (1) lupus vulgaris; (2) tuberculosis cutis orificialis (tuberculosis ulcerosa); (3) tuberculosis verrucosa cutis; (4) scrofuloderma. In addition to these varieties, the results of recent investigations prove almost conclusively that erythema induratum (Bazin) also is frankly tuberculous in nature. For the present, however, it will be considered separately.

Lupus Vulgaris.—This form of tuberculosis of the skin is frequently characterized by the occurrence of patches of small, soft, "apple-butter-like" tubercles which may ultimately undergo absorption but which may ulcerate, and finally heal with more or less scarring. The

malady progresses by the formation of new nodules which coalesce to form irregular plaques of various sizes. The face, particularly the nose, is the most frequent site of the disease, although no part of the body, including the mucous membrane, is exempt. The course of the affection is slow but progressive. The nodules gradually enlarge until they have attained the size of a pinhead or a small pea. Regressions, with subsequent atrophy, may then take place, but as a rule the lesions break down and form small crusted ulcers which ultimately are replaced by fibrous tissue. The ensuing deformity is sometimes very great. Various names have been suggested for those

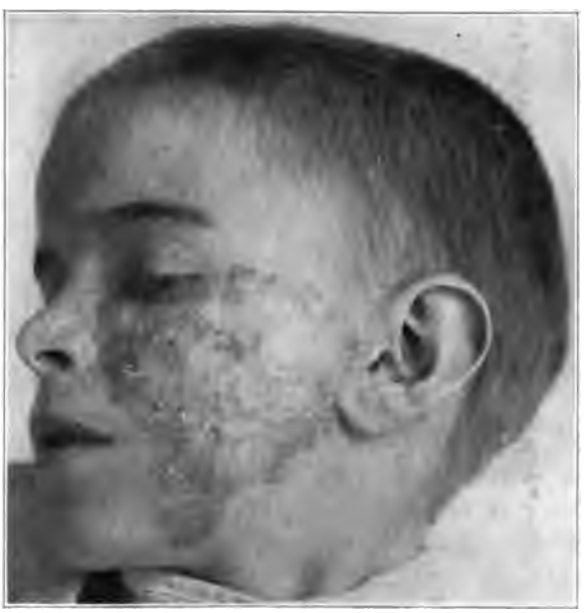

Fig. 554.—Lupus vulgaris. Extensive lesion in a seven-year-old boy. (Courtesy of Dr. Howard Fox.)

types which present some pronounced clinical feature. Thus in "lupus exfoliativus" the nodules slowly disappear spontaneously, leaving a thin, atrophic, scaly, and often pigmented area to mark the site of the former lesion. "Lupus hypertrophicus" and "lupus sclerosus" are characterized by the formation of thick, rough, hypertrophic cicatrices which are almost keloidal in aspect. "Lupus serpiginosus" is a designation sometimes applied to those cases in which the patches assume a serpiginous or gyrate outline. In "lupus papillomatosus," a not uncommon variety in the genital regions and

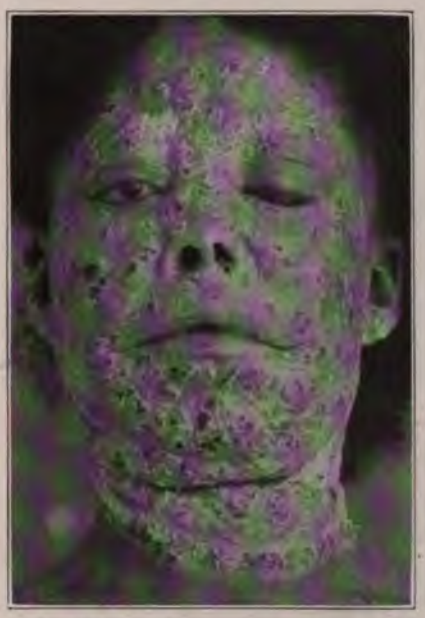

Fig. 555.—An extensive case of lupus vulgaris of the face. (Courtesy of Dr. Howard Fox.)

Fig. 556.—Lupus vulgaris. (Courtesy of Dr. A. J. Markley.)

Fig. 557.—Lupus vulgaris. (Courtesy of Dr. A. J. Markley.)

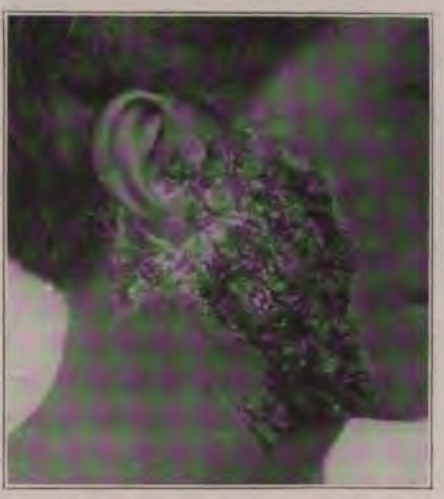

Fig. 558.—Lupus vulgaris in a full-blooded Indian. (Courtesy of Dr. Everett S. Lain.)

on the ankles and dorsal surface of the feet, the affected areas may become papillomatous and almost verrucose, generally with more or less exudation and crusting.

As a result of the ulceration, cicatrization and contraction the ensuing deformity may be very great, often so much so as to render life almost

Fig. 559.—Lupus vulgaris. (Courtesy of the U. S. Public Health Service, Immigrant Hospital, New York City.)

Fig. 560.—Lupus vulgaris. Only the right cheek was affected, and the lesion had been present for over 30 years.

Fig. 561.—Lupus vulgaris. (Courtesy of Dr. H. H. Hazen.)

intolerable for the afflicted individual. In a statistical study of 374 cases, Bender found the face to be affected in over 75 per cent, the upper extremities in about 10 per cent, and the lower extremities in 4 per cent. On the trunk and extremities the patches are frequently serpiginous in character. The mucous membranes are involved in a

large percentage of cases (72 per cent, Forchhammer). The nasal mucosa and the lips are attacked most frequently. The lesions are sharply defined, reddish or grayish in color, and often become papillomatous.

Multiple Disseminated Lupus Vulgaris is a term applied to a rather unusual type of the disease which may follow measles or chicken-pox. The lesions consist of small, circumscribed collections of brownish, scale-covered nodules which appear suddenly, and are irregularly distributed over the face, trunk and extremities. I have seen two cases of this form, both in out-patients at Blackfriars Hospital, London, in the service of the late Mr. T. J. P. Hartigan. Ormsby, Dore, and others have reported similar examples. Two or more clin-

Fig. 562.—Tuberculosis verrucosa cutis. (Courtesy of Dr. William Allen Pusey.)

ical forms of cutaneous tuberculosis are occasionally present in the same patient. J. C. White has reported a series of cases of this kind in which lupus vulgaris, scrofuloderma, and tuberculosis verrucosa cutis were intermixed.

Subjective symptoms are usually absent, and fever and lymph-node involvement are seldom present unless the tuberculous process is general, or secondary (staphylococcic) infection occurs. Except in the acute, disseminated cases, the disease develops slowly and insidiously. The chronic course of the disease is characterized by periods of retrogression and exacerbation, and may extend over a period of many years or even a lifetime.

Tuberculosis Cutis Orificialis.—This variety, which is nearly al-

ways secondary to tuberculosis of the internal organs, particularly the lungs, attacks the integument contiguous to the mucous outlets, and begins by the formation of yellowish, miliary tubercles, which quickly break down to form rounded or oval, sluggish, granulating, painless ulcers. As in other forms of tuberculosis, the progress of

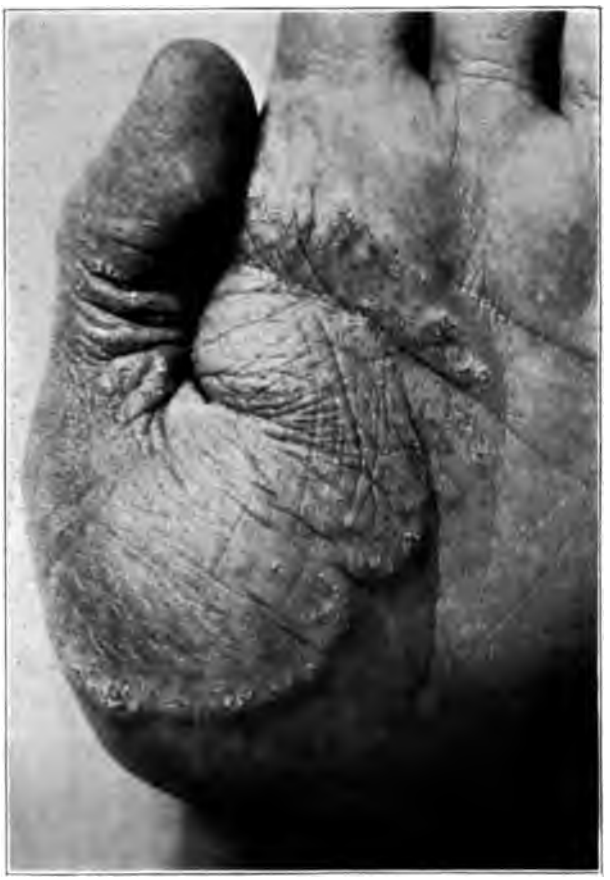

Fig. 503.—Tuberculosis verrucosa cutis. (Courtesy of Dr. A. J. Markley.)

the disorder is extremely slow. The favorite sites are the oral, anal, and genital regions. The lesions are usually superficial, with soft, irregularly outlined edges, and a raw, uneven floor which is covered with purulent fluid. Often there is an overlying thin, yellowish crust. In those cases in which the tongue is attacked the patient suffers great pain and discomfort. Tuberculous ulcers may occur as a result of

infection from without, from the deposition of tuberculous material through the blood stream, or by contiguity.

Tuberculosis Verrucosa Cutis.—This variety of cutaneous tuberculosis was first clearly defined and accurately described by Riehl and Paltauf, in 1886. Infection usually, if not invariably, occurs from without (as a result of coming in contact with contaminated objects, particularly tuberculous cadavers, the tissues of infected animals, and tuberculous sputum). The sites of predilection are the exposed surfaces of the body, particularly the dorsal surface of the hands and fingers. The lesions begin as small, wart-like papules which gradually increase in

Fig. 564.—Tuberculosis verrucosa cutis. (Courtesy of Dr. J. B. Shelmire.)

Fig. 565.—Tuberculosis verrucosa cutis. (Courtesy of Dr. H. H. Hazen.)

number and coalesce to form small, verrucose patches which are rounded or oval in outline and reddish or brownish in color. The periphery is dark red, and there is often some accompanying exudation or even suppuration, with more or less crusting. Frambesiform and vegetative tendencies occasionally are present. The patches are usually single, but may be multiple. Ulceration is rare. The disease progresses by peripheral extension and by the coalescence of adjacent patches. The lesions may heal spontaneously, leaving thin, atrophic, whitish cicatrices. Occasionally, other forms of tuberculosis also are present, as in Parounagian's patient, an Armenian, aged 32, who had tuberculosis verrucosa

cutis, scrofuloderma, and lichen scrofulosorum, together with syphilis.

Verruca Necrogenica, or "postmortem wart," is a localized form of tuberculosis of the skin which closely resembles, and is probably identical with, the disorder just described. The lesions are pea- to bean-sized,

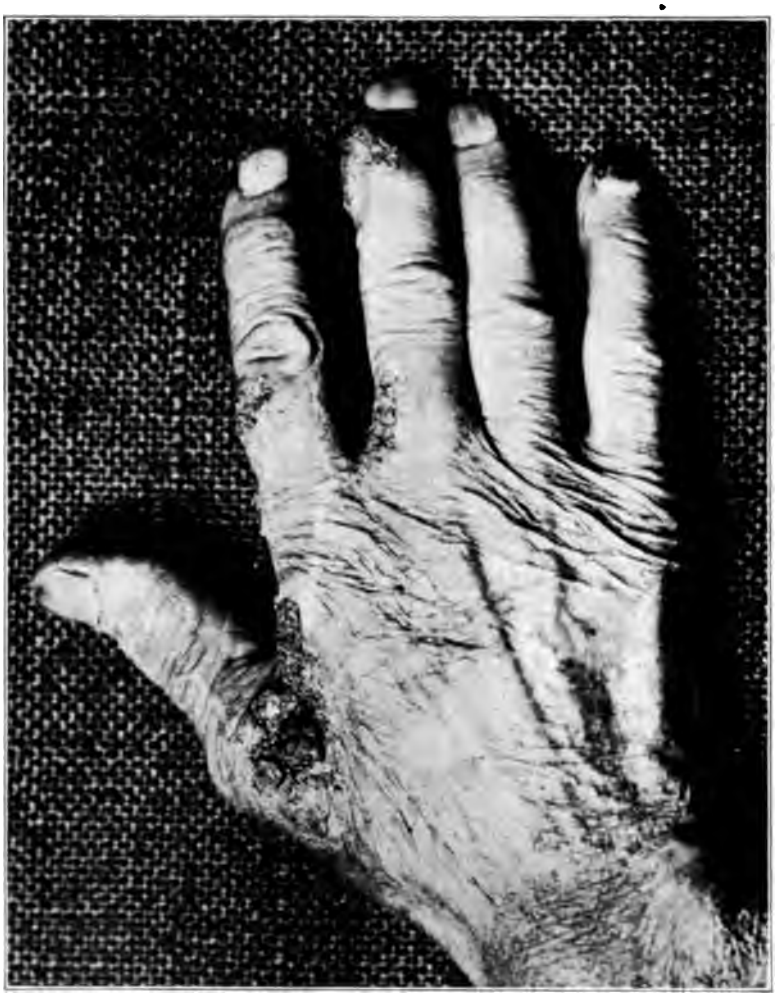

Fig. 566.—Tuberculosis verrucosa cutis. (Courtesy of Dr. H. C. Varney.)

or larger, reddish, or whitish, wart-like, papular or perivascular masses, and are usually single. They develop most frequently on the dorsal surface of the thumb and fingers, particularly in the neighborhood of the knuckles and the interphalangeal joints, and generally at the site

of some pre-existing injury or abrasion. The lesions tend to spread peripherally, although they seldom attain a diameter of more than 1 or 2 cm. They are usually indurated, and always keratotic. Pigmentation is not uncommon. The growths are persistent, but are relatively benign in nature. They often disappear spontaneously with but slight scarring. Rarely, necrogenic verrucae are followed by generalized tuberculosis. Occasionally, as a result of secondary streptococcic or staphylococcic infection, erysipelas or septicemia may develop. The most frequent victims of the disorder are butchers and packing house employees, although anatomists, students, and dissecting room attendants are sometimes attacked.

Scrofuloderma.—This term is best restricted to those cases in which the skin is involved secondarily by direct extension from cutaneous glands and lymphnodes or bones which are tuberculous. The cervical lymphnodes are those most commonly affected, although other regions occasionally are involved. The infected nodes become swollen, firm and adherent to the overlying skin. In size the masses vary from that of a hazelnut to that of a lemon. They are at first nodular, firm and elastic, but later, as a result of suppuration or caseation, they may become doughy and, ultimately, fluctuant. In the course of several months or years the overlying skin becomes thinned, purplish, and depressed, and finally breaks down at one or more points, to form an ulcer. These lesions are oval or elongated in shape, and are really the mouths of sinuses which extend far downward into the diseased tissue, and from which there is a more or less continuous discharge of purulent matter. Occasionally these subcutaneous channels are so superficially located that they give rise to extensive ulceration of the skin. The sinus walls are reddish and granular, and bleed readily. As in practically all tuberculous processes, the lesions are soft. The subjective symptoms are remarkably trivial, and constitutional manifestations are slight, or entirely wanting. The lesions may heal spontaneously, with the formation of rough, corded cicatrices, but in many instances the disease persists for years with little or no change. The majority of patients are children and young adults.

Tuberculous Gummata are subcutaneous tuberculous lesions which develop independently of demonstrable lymphnodes. Ultimately the integument over the entire mass breaks down and an ulcer is formed. The condition is probably identical with the "tuberculous lymphangitis" of Bazin.

Under the title "nodular tuberculosis of the hypoderm," Wende

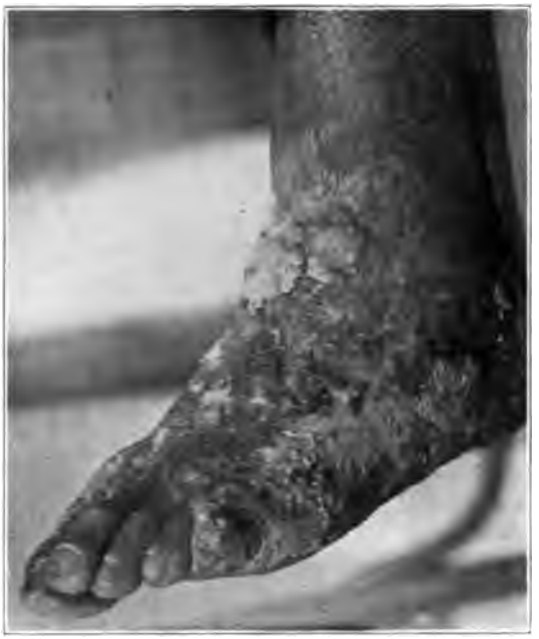

Fig. 567.—Tuberculosis verrucosa cutis. (Courtesy of Dr. H. H. Hazen.)

Fig. 568.—Scrofuloderma.

has described an unusual form of tuberculosis of the skin characterized by the occurrence of painful, subcutaneous nodules which vary in size from that of a pea to that of an English walnut, and which do not break down or ulcerate. The chin, cheek and temples were involved in Wende's case. The overlying epidermis was normal in color. A few of the lesions underwent spontaneous involution.

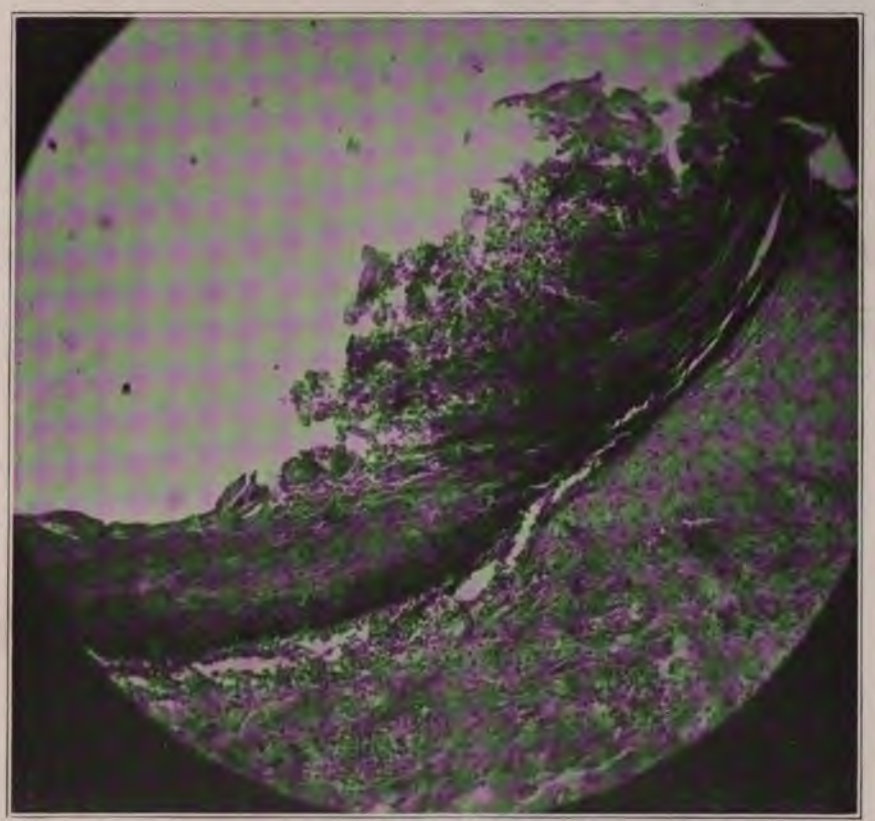

Fig. 569.—Duhring's small pustular scrofuloderm, showing desiccated lesion. Low magnification.

Histologically the tumors were tuberculous in character. Animal inoculations proved positive. In some respects the lesions resembled the so-called sarcoids of Darier-Roussy.

Etiology.—Tuberculosis of the skin commonly develops in young persons whose vitality has been lowered by disease or starvation. The majority of cases develop between the second and tenth years of life. The tubercle bacillus may reach the skin through the blood

or through the lymphatics, and it is probably by one or the other of these routes that lupus vulgaris and the acute disseminated examples which occasionally develop following the exanthemata are usually produced. In scrofuloderma, as in tuberculosis cutis orificialis, the skin affection is secondary to tuberculosis of some internal organ. Tuberculosis verrucosa cutis and verruca necrogenica commonly develop as a result of infection from without, following contact with tuberculous material from any source. It is probable that in many of the latter cases the organisms are of the bovine type.

Pathology.—In the skin, the tubercle bacillus gives rise to histologic changes which are practically identical with those resulting from its presence in other tissues of the body. The essential lesion is the so-called "tubercle" or tuberculous nodule, which is located in the corium, and consists of one or more giant cells which usually contain demonstrable bacilli (by the Much method), and are closely surrounded by a layer of small mononuclear leucocytes with a few intermixed multinuclear cells. A broad zone of plasma and connective-tissue cells encompasses the whole, and a limited capsule of connective tissue may or may not be present. There are no vessels in the center of the mass, and those at the periphery exhibit inflammatory and obliterative changes. The epidermis is never involved primarily, and is usually stretched and thinned, as a result of pressure from below. Degeneration and necrosis occur first in the center of the nodule, and are primarily characterized by tinctorial changes (a lessened affinity for the basic dyes) in the affected elements. Bacilli are most numerous in lesions of the miliary type (tuberculosis cutis orificialis), and least common in scrofuloderma. In fact, for many years it was thought that "glandular scrofula" was a non-tuberculous condition. In tuberculosis verrucosa cutis (Riehl—Paltauf) the inflammatory process begins at a point high up in the derma, and papillary hypertrophy is an early and conspicuous feature of the disease. The ensuing epidermal changes render the epithelium extremely susceptible to pyogenic involvement, and superficial miliary abscesses are of comparatively common occurrence.

Diagnosis of Tuberculosis Cutis.—Tuberculous lesions are to be differentiated from those of carcinoma, syphilis, lupus erythematosus, and blastomycosis. Lupus vulgaris usually begins in early life, the nodules develop on previously sound skin, and are always soft and compressible. Under a diascope (pressure glass) the tubercles ap-

pear as yellowish, apple-butter-colored points, surrounded by exsanguinated sound skin. Tuberculous ulcers have soft, non-elevated margins, and their bases are usually granulating and pliable. In both the squamous-celled and basal-celled carcinoma the growths frequently arise from some pre-existing lesion, such as a seborrheic keratosis, and their margins are hard, indurated and pearly. The patients are usually adults, and the course of the disease is comparatively rapid. In the serpiginous lesions of syphilis the characteristic nodules of lupus are absent, and concomitant signs of syphilis (lymphnode enlargement, mucous patches, in women a history of one or more miscarriages, and a positive serum or luetin reaction) are usually present. As a rule the scars are soft, atrophic, and whitish or brownish in color. They are seldom rough, indurated and reddish as in lupus. Syphilitic lesions develop rapidly and break down quickly. In lupus erythematosus, which is a disease of adult life, the sites of predilection are the flush areas of the face. The lesions are often symmetrical, and are always smooth and superficial. Scaling may be present, but never ulceration or crusting. The sebaceous orifices are dilated and patulous, and the cicatrices are always thin, soft and pliable. In doubtful cases recourse may be had to a tuberculin test, but it should always be borne in mind that an individual may be affected with both tuberculosis and syphilis at the same time, and also that many apparently normal adults exhibit a strong reaction to tuberculin. The lesions of tuberculosis verrucosa cutis often bear a striking resemblance to those of blastomycosis cutis. In blastomycosis the course of the disease is more rapid, and the inflammatory process more acute in character. Suppuration is usually a pronounced feature, and considerable quantities of pus (which usually contains numerous blastomycetes) can be squeezed out from between the papillomatous projections. A microscopic examination of some of the material thus obtained and mixed with a few drops of a 10 per cent solution potassium hydrate, usually will serve to identify the blastomycetic disorder.

Prognosis of Tuberculosis Cutis.—The prognosis in lupus vulgaris is largely dependent upon the extent and location of the involved areas. As encountered in America, the disease is a comparatively benign one, but even with this lessened severity it is an extremely chronic disorder, rebellious to treatment, and prone to relapses and recurrences. Systemic tuberculosis is present or develops in a con-

siderable proportion of the cases (from 5 to 20 per cent), a fact which should always be borne in mind when making a prognosis. The outlook in the miliary and disseminated types is even graver. In tuberculosis verrucosa cutis the lesions are, as a rule, amenable to treatment, and seldom jeopardize the life of the patient.

Treatment of Tuberculosis Cutis.—We possess no specific remedy, either internal or external, for tuberculosis of the skin. The general health of the patient should receive attention. Hygienic measures are almost as important in this form of the disease as in the systemic variety. Fresh air, sunlight, plentiful amounts of simple, nourishing food, and moderate exercise, all are helpful. A change of climate is frequently beneficial. Of the various internal remedies that have been recommended, cod-liver oil, arsenic and the hypophosphites are the most valuable. In some cases improvement has followed the administration of thyroid extract. During the past few years tuberculin has been reintroduced as a therapeutic agent, and many observers report pleasing results following its employment. MacKee found it most valuable in the non-ulcerating types of lupus and in tuberculosis verrucosa cutis, and least effective in the ulcerating forms and in scrofuloderma. According to Duke, who has had wide experience in the use of the agent, the theoretical object of a course of tuberculin medication is to increase the sensitiveness and tolerance to a point which will prevent the spread of the disease and will also render the patient immune to products of the tubercle bacillus. A readily soluble preparation (Koch's old tuberculin, T., O. T., or A. T.) should be used and under no circumstances should the agent be diluted until injected. Diluted tuberculin deteriorates rapidly, and may become completely inert in less than a fortnight. In estimating the dosage, Duke recommends that the first dose be so small that it cannot cause a serious reaction, even in the most susceptible individual. It should then be increased rather rapidly to a point which just falls short of producing a reaction. The amount is then slowly increased, as tolerance is established, but should never be allowed to reach a point where reaction (as evidenced by pyrexia, nausea, anorexia, headache, malaise, etc.) results. The injections are given twice weekly, and the amount to be administered is best estimated by the Pope-Brown method:

2	3	4	5	6	8	10	12	15	20
10	10	10	10	10	10	10	10	10	10
32	22	18	16	15	13	13	12	12	11
100	46	32	25	22	18	16	15	14	12.5
	100	56	40	32	24	20	18	16	14
		100	63	46	32	25	22	18.5	16
			100	68	42	32	26.5	21.5	18
				100	56	40	32	25	20
					75	50	38	29	22
					100	63	46	34	25
						79	56	40	28
						100	68	46.5	31.5
							83	54	35
							100	63	40
								74	50
								86	56
								100	63
									71
									79
									89
									100

For the initial dose, 10 cm. of a one to one million dilution is given. At first the dose is increased according to the bases marked 4, 5 or 6—that is, it is increased rather rapidly. When the 100 cm. dose is reached 10 cm. of the next lower dilution (one to one hundred thousand) is given, and this is increased as was the previous dilution until the faintest sign of a reaction is produced. The dose is then slightly reduced, and afterward increased very gradually.

Local Treatment.—Röntgen-therapy, radiumtherapy, heliotherapy, and phototherapy are the most efficient methods that we possess for the local destruction of the lesions. Of these, phototherapy, by means of the Finsen lamp, gives the best cosmetic results. Unfortunately the method is an extremely tedious one, and months or years of treatment are generally required to bring about a cure. Röntgen-therapy is much more rapid, but the ensuing cicatrices are usually conspicuous and unsightly, and telangiectasis is a common accompaniment. Several observers have reported good results following the use of radium, but in my hands this agent has not proved a very effective one in the treatment of tuberculosis of the skin. Small patches may be excised, or destroyed with the actual cautery or by Höllander's method. Of the various antiseptics and caustics that have been suggested, Brooke's ointment of oleate of mercury has been found useful by Stelwagon. It is composed of

℞ Oleati hydrargyri (5%).....ʒ i (30.0)
Zinci oxidi,
Amyli pulveris .....āā ʒ iii (8.0)
Acidi salicylici .....gr. xx (1.35)
Ichthyolis .....♏ xx (1.35)
Petrolati .....ʒ iv (15.0)
Misce.

This is to be rubbed in, or applied spread on a plaster, night and morning.

Pyrogallol is probably the best of the chemical caustics. It is applied in the form of an ointment, in strengths of from 20 to 25 per cent, twice daily for one week, and gives rise to very little scarring. Mercuric chloride, in lotions or in ointments (0.5 to 1. per cent), is highly spoken of by such authorities as J. C. White and Doutrelepont.

Unna's thorn treatment, which consists of the insertion into each of the nodules of a small thorn which has been saturated with liquor stibii compositus (Ger. P.), is quite effective, and is widely employed in Germany, but I doubt if the method will ever prove a popular one in this country. The projecting bases of the thorns are clipped off, and a zinc-oxide plaster mull applied. In the course of a few days the thorns are cast off and a granulating surface is left. A soothing, antiseptic ointment is then substituted and its use continued until the area is completely healed. Heidingsfeld employs trichloracetic acid, which is applied to the affected areas by means of a small, cotton swab. Pure lactic acid also has been recommended, and is particularly valuable as an adjuvant measure following curettage. Thorough freezing of the lesions with liquid air or with carbon dioxide snow is sometimes followed by material improvement. It is probable that the congestion which follows the application of the refrigerant is almost as beneficial as the direct action of the cauterant itself. Pfannensteil has suggested a rather unique plan of treatment which has proved successful in the hands of Strandberg, Forchhammer, and others. By the administration of an iodine salt internally, and the application of hydrogen peroxide on gauze packs, locally, nascent iodine is liberated in the tissues. The method is particularly effective in combating intranasal lupus.

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Unna, Berl. klin. Wchnschr., 1915, lii, p. 653 (abst. Jour. A. M. A., 1915, lxv, p. 52), strongly recommends his "green lupus salve" in those instances where the x-rays are unavailable. The formula for it is as follows:

Salicylic acid	
Antimony chloride solution	āā 2 parts
Extract of cannabis indica	
Creosote	āā 4 parts
Lanolin	8 parts

(The antimony chloride solution is the Liq. stibii chlorati of the German pharmacopeia, and is a 33.3 percent. solution of antimony trichloride in 12.5 percent. hydrochloric acid.)

In the benign cold abscesses developing secondarily to tuberculous disease in the glands or joints, Unna recommends a salve soap, composed of:

Potassium hydroxide	84 parts
Cod-liver oil	500 parts
Distilled water	475 parts
Alcohol q. s. (about 20 parts).	

To be rubbed in well several times daily. It is a good plan to give cod-liver oil internally at the same time.

TUBERCULIDES.

Synonyms.—Toxicotuberculides; Paratuberculides.

The expressive term "Tuberculides" was first employed by Darier, in 1896. Under this heading he would place: (1) Acnitis; (2) Acne cachecticorum; (3) Lichen scrofulosorum; (4) Lupus erythematosus; (5) Lupus erythematosus disseminatus; (6) Lupus pernio; (7) Erythema induratum; (8) certain varieties of nodular and tuberculous lupus occurring in multiple patches.

Darier thought that the theory that these eruptions were due to the multiple embolism of bacilli of low virulence, which rapidly succumbed in the fight with the tissues, explained in a satisfactory manner all the known facts. C. J. White concludes that "there is a class of skin affections analogous to the parasyphilitic, which may be called paratuberculoses. They are not in themselves tuberculous, but develop and flourish on tuberculous soil. They may be divided

into three groups: scrofuloderms (which are pure pyodermias), tuberculides (which are only accidentally pustular), and dyschromia. The tuberculides include a variety of affections, ranging from erysipelas perstans to lichen scrofulosorum, which are toxidermias, their characteristic in common. Those which approach lichen scrofulosorum more closely exhibit evidence which precludes the consideration of any toxin other than tuberculin. The status of others (e.g., lupus erythematosus) is in great doubt. Tuberculous dyschromia (pigmentary tuberculide, and leucodermia tuberculosum) includes only one affection at present, hyperpigmentation, which, except for its peculiar distribution, is that seen in many other

Fig. 570.—Tuberculide, in a tuberculous man, age 25. The lesions had been present five weeks.

cachexias. The points upon which the right of a disease to admission to this category rests are: Absence of tubercle bacilli, proved by microscopic examination and inoculation; occurrence in scrofulous or frankly tuberculous patients in more than a bare majority of cases; a pathologic anatomy at least comparable to that recognized for tuberculosis; and finally, if possible, as in the case of lichen scrofulosorum, experimental production of the disease by the injection of tuberculin."

The following are the more important members of this group:

Lichen Scrofulosus.—Synonym.—Lichen scrofulosorum.

Definition.—A chronic inflammatory disease of the skin, occur-

ring mainly in tuberculous subjects, and characterized by the occurrence of groups of pinpoint- to pinhead-sized, pinkish or reddish, desquamating papules.

Symptoms.—The lesions are minute, flesh-colored to reddish, conical papules, and tend to form rounded, circinate or segmental patches. In the course of a few weeks the lesion reaches its maximum size, a scale develops and may persist for several weeks or months, but drops off as the papule regresses, leaving a yellowish or brownish pigmented spot which ultimately also disappears, leaving no scar. The sites of predilection are the sides of the trunk, and occasionally the limbs. Itching is slight or entirely absent. The subjects are almost invariably sufferers from tuberculosis, particularly tuberculosis of the skin, and occasionally a group of papules is found near or surrounding a lupus vulgaris patch or a scrofuloderma lesion. Fresh papules develop from time to time, and the disease may persist for years.

Etiology.—The malady is common in Prussia, and comparatively so in Great Britain. In this country it is extremely rare. The very frequent association of the disorder with tuberculosis and particularly with scrofuloderma is highly suggestive. Although the bacillus has been recovered in a few instances, animal inoculations have almost invariably proved negative. The belief that it is a paratuberculous condition (a disorder resulting from the action of tuberculous products) is gaining ground, and is very probably the correct one. Nobl has observed the development of clinically typical lesions following the use of tuberculin ointment, and cases have been reported in which the lesions appeared during the course of a series of tuberculin injections.

Pathology.—The histopathology of the disease has recently been exhaustively studied by Gilchrist, the patient being a young negro. He found (1) semiglobular-looking masses situated in the horny layer and in the majority of instances around the hair follicles, and (2) marked pathological changes in the upper portion of the corium beneath these papular masses and also around the hair follicles, especially the deepest portion. The blood vessels in the upper part of the corium and papillae were dilated, and many polynuclear leucocytes had wandered out into the tissue and into the epidermis up to the horny layer when these cells became disintegrated; numerous lymphoid cells were found in the same situation, undergoing the same processes. Thus a mass of detritus and an apparently firm

ground substance, which stained readily with eosin, was deposited in the horny layer. The stratum lucidum and stratum granulosum had both disappeared. Large masses of pigment granules were scattered throughout the papular lesion. This pigmentation was most marked in the older lesions. In four of the sections typical tubercles, with giant cells in the center, surrounded by numerous epitheli-

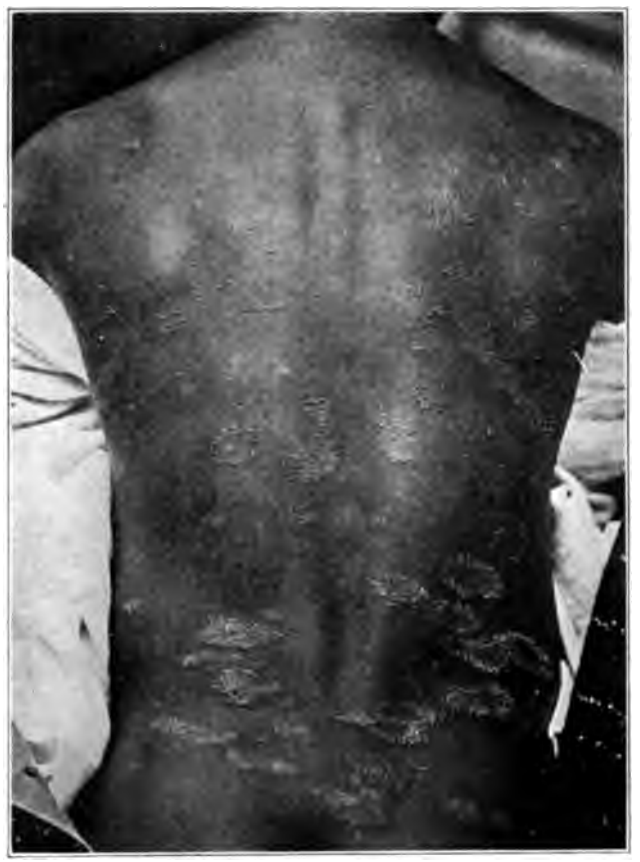

Fig. 571.—Lichen scrofulosus in a negro. (Courtesy of Dr. T. Caspar Gilchrist.)

oid cells and mononuclear round cells at the periphery, were found in the vicinity of the hair follicles. The follicles themselves were unaffected. No tubercle bacilli were found in any of the sections.

Diagnosis.—The affection is to be differentiated from keratosis pilaris, in which the lesions are not grouped, and are limited to the outer surfaces of the thighs and upper arms; from the small papu-

lar syphiloderm, in which the eruption is generalized, symmetrical, and accompanied by lymphnode enlargement and other manifestations of lues; and from papular eczema, in which the lesions are bright red, frequently interspersed with vesicles, often exhibit more or less moisture, and are invariably itchy.

Prognosis.—The prognosis is always favorable, the lesions promptly disappearing under appropriate treatment.

Treatment.—Hebra recommended cod-liver oil, internally and externally. Internally, in doses of from one to four drams (4.0 to

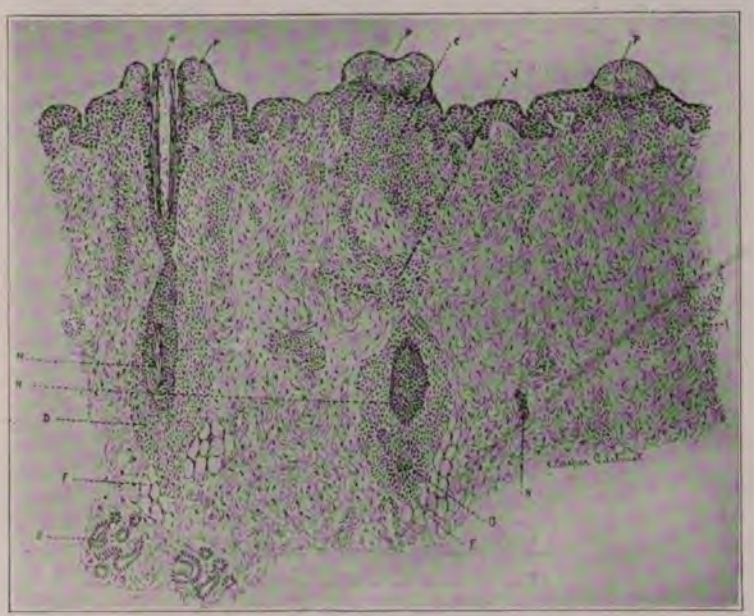

Fig. 572.—Lichen scrofulosorum. Moderate magnification. (Courtesy of Dr. T. Caspar Gilchrist.)

16.0) three times daily, the drug answers admirably and is almost a specific, but for local applications Crocker and others have shown that petrolatum, plain, or with 1 per cent of thymol or oil of cade, or 3 per cent of liquor plumbi subacetatis added, serves as well as oleum morrhuae, and is far more acceptable to the patient.

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Acne Scrofulosorum.—In this type the lesions are discrete, pinhead-sized, acuminate, reddish papules which involve the hair folli-

cles on the buttocks and the external aspects of the limbs. The lesions commence as red points, which gradually develop into small papules on the tips of which tiny vesicles form. These soon become pustular, and ultimately crusted. When the crusts drop off, funnel-shaped, cicatrized depressions are left. The duration of an individual lesion is from four to eight weeks. Involution takes place gradually. There is some subsequent pigmentation and scarring. The eruption commonly occurs in scrofulodermatous subjects, and gives rise to no subjective symptoms.

Acnitis.—This type was originally described by Tilbury Fox, under

Fig. 573.—Acnitis. (Courtesy of Dr. L. W. Ketron.)

the title of "Disseminated Follicular Lupus," in 1878. The name "acnitis" was first employed by Barthélemy, thirteen years later. Crocker suggested for the disease the designation of "acne agminata." The lesions are pinhead-sized or larger, brownish-red papules, or thin-walled pustules, which may be discrete, but which usually tend to grouping. Occasionally two or more coalesce to form oblong or irregular, nodular patches. The chin, cheeks, temples, and forehead are the regions commonly involved, although the forearms and other parts of the body are sometimes attacked. The lesions are indolent and persistent, but finally undergo involution, with or without suppuration. Pigmentation and scarring are the

rule. Histologically, Ketron found in the swollen nodules (1) a central, finely granular, homogeneous mass, containing toward its periphery a few picnotic nuclei and nuclear fragments; (2) surrounding this a ring of cellular tissue, composed of round, oval or large spindle-celled nuclei of the epithelioid type. These cells often lie in small groups or nests, and show a concentric arrangement.

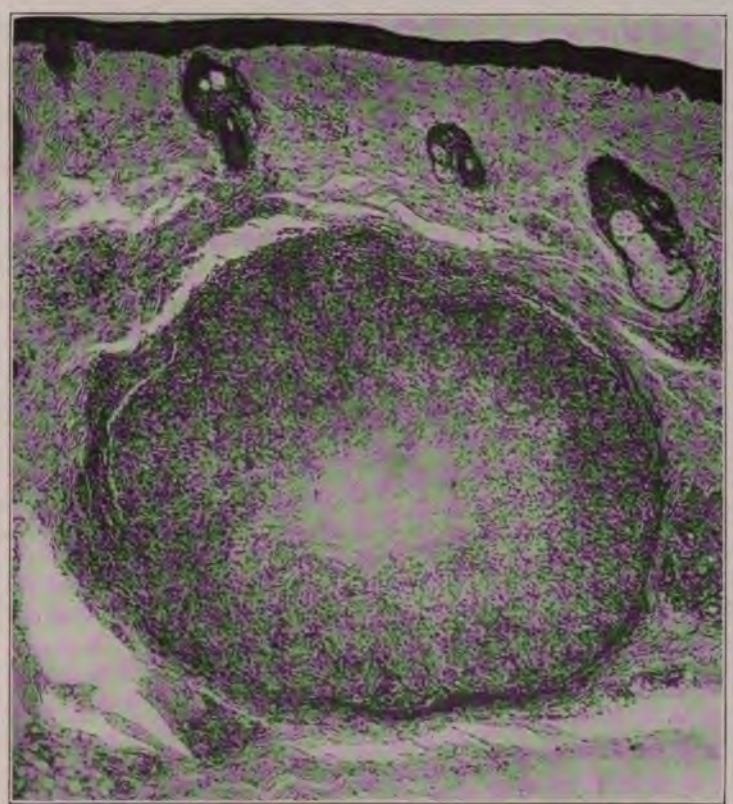

Fig. 574.—Acnitis. Moderate magnification. (Courtesy of Dr. L. W. Ketron.)

(3) Lying between the above described ring and the surrounding layer of normal compressed collagenous tissue were variable numbers of small round-cells, between which were scattered a few swollen epithelioid cells. The nodule was devoid of blood vessels except in this outside round-cell layer. Occasionally a fragment of elastic tissue was seen in the central necrotic mass. Elastic tissue was absent from the layer of epithelioid tissue. Just outside the

nodule Ketron found several round or oblong, infiltrated masses which consisted of a small group of epithelioid cells of the same type as those occurring in the larger nodules. About the periphery were scattered a few small round cells, and in one section a giant cell was seen. These small infiltrations were in no way connected with the coil glands, hair follicles or sebaceous glands, but lay definitely along the course of the small blood vessels.

The exciting cause of acnitis is unknown. Many of the patients react positively to the tuberculin, however, and in several instances animals have been successfully inoculated with material from the lesions.

Folliclis.—This type, which is identical with Bronson's "acne varioliformis of the extremities," Pollitzer's "hidradenitis destruens suppurativa," and the "spiradenitis suppurativa disseminata" of Unna, is characterized by the occurrence of firm, discrete, pinhead- to pea-sized, subcutaneous nodules on the hands, forearms, feet and legs. Other parts occasionally are involved. In the course of a few days or weeks the lesions reach the surface, become pustular, and ultimately heal spontaneously, giving rise to small, jagged, atrophic scars, often with some accompanying pigmentation. Relapses and recurrences are not infrequent, and the patient may not become entirely free of the eruption for a long period of time (4 years in a case under Ormsby's care, and 10 years in one reported by Barthélemy). The histopathology of the affection is a matter of dispute, many competent observers maintaining that the coil glands are primarily involved; others, equally skilled, holding that the sweat coil lesions are secondary.

Erysipelas Perstans.—This type, the "Erysipelas faciei perstans" of Kaposi, in some respects resembles acute, disseminated lupus erythematosus. The eruption consists of persistent, erysipelas-like swellings on the face; and occasionally on the hands and other parts of the body. The lesions develop in crops, and are usually accompanied by symptoms of serious systemic disturbance. The majority of the patients die of acute pulmonary tuberculosis.

Prognosis and Treatment of the Tuberculides.—In all of the types excepting erysipelas perstans the lesions tend to disappear spontaneously, in the course of several weeks or months. They usually give rise to slight scarring, and oftentimes some pigmentation. The treatment of lichen scrofulosus has already been considered. In the other forms, fresh air, sanitation, nourishing food, and tonics, par-

ticularly cod-liver oil, arsenic and the hypophosphites, are equally important. MacKee found tuberculin of little or no value in the treatment of tuberculides. Locally, an ointment containing ammoniated mercury (5 per cent) often proves beneficial, and the application of mercurial plaster is strongly recommended by Crocker. Röntgen-therapy has proved useful in the hands of Pusey, Ormsby, Ketron, the author, and others.

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ERYTHEMA INDURATUM.

Synonyms.—Bazin's disease; Erythema induratum scrofulosorum.

Definition.—A chronic, inflammatory disease of the skin, probably tuberculous in nature, characterized by the development of ill-defined, indurated, symmetrical, subcutaneous nodules which terminate in absorption or necrosis.

Symptoms.—The majority of the patients are girls or young women who are likewise the victims of circulatory disturbance (feeble circulation). The lesions develop insidiously, and are usually confined to the legs, particularly the calves, and the lower third of the thighs. The nodules develop in the deeper layers of the skin and the subcutaneous tissues (in the panniculus adiposus), and first become apparent to the touch as rounded or oval, pea- to dime-sized, indurated masses which are slightly tender on pressure, and tightly adherent to the overlying structures. Occasionally two or more lesions coalesce, forming an irregularly outlined, nodular plaque. In the course of several weeks or months the more superficial layers of the skin are involved, and the affected integument assumes a reddish or purplish hue. At this stage the lesions are rounded or oval in outline, ill-defined, and of firm consistence. Later they may become doughy or even fluctuant, and superficial necrosis is not uncommon. Many undergo spontaneous involution, however, leaving discolored, reddish or brownish spots which persist for some time. The entire mass may break down

at once, but as a rule the necrosis is circumscribed, and the process is comparatively superficial. In number, the lesions vary from three or four to a dozen or more. Generally the disease is limited to the lower extremities, but occasionally the arms, and even the trunk, may be involved.

Fig. 575.—Erythema induratum, showing ulcerating lesions on calf. (Courtesy of Dr. H. C. Varney.)

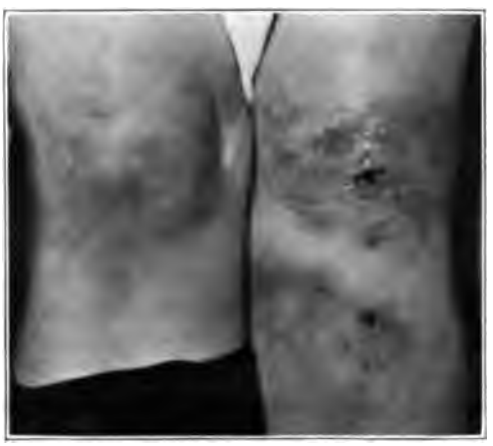

Fig. 576.—Erythema induratum. The lesions are much nearer the knees than in the average case of the disease.

Fig. 577.—Erythema induratum involving the forearm. (Courtesy of Dr. H. C. Baum.)

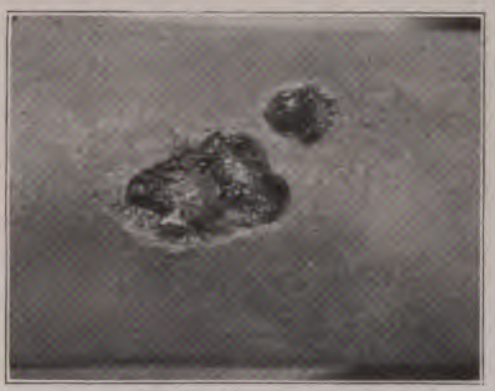

Fig. 578.—Erythema induratum. Ulcerative stage. (Courtesy of Dr. Howard Morrow.)

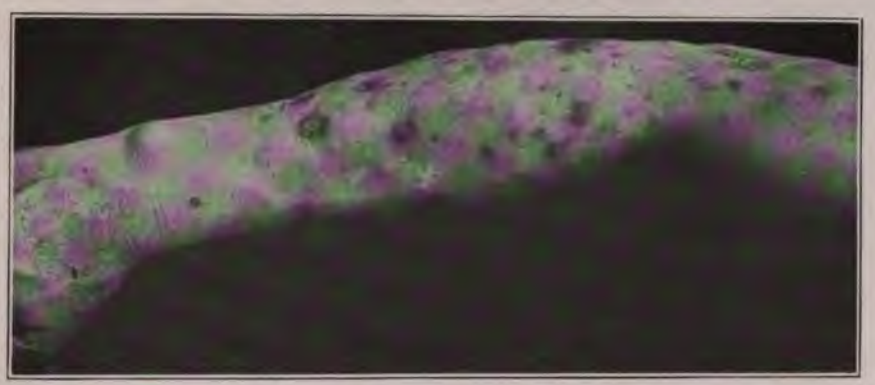

Fig. 579.—Erythema induratum. Trunk and limbs involved. (Courtesy of Dr. Grover W. Wende.)

Etiology and Pathology.—The affection is probably of tuberculous origin. Audry believes it to be related to what he calls "lymphatism." Leredde and Johnston class it with the tuberculides, and Mantagazza with the scrofulodermata, but the results of the investigations of Thibierge and Ravaut, Fox and Eyre, Gilchrist, Macleod and Ormsby, and others, indicate that the tubercle bacillus is etiologic in at least a certain percentage of the cases. It is very probable, as Whitfield has intimated, that there are two general classes of cases which are clinically indistinguishable. The first of these is due to the action of the tubercle bacillus, the second to any one of several causes. As Whitfield states, the nodules of the non-tuberculous form, or forms, are apparently more acute and more painful, of shorter duration, are less liable to ulcerate, and, as a rule, affect older people. It is quite possible that certain types of erythema nodosum, and particularly the variety which is due to the organism described by Rosenow, may simulate Bazin's disease very closely.

Histologically, the lesions are granulomatous in character, with many giant and plasma cells. The walls of the blood vessels which penetrate the involved area invariably exhibit inflammatory changes.

Diagnosis.—The distribution and history of the lesions, their course, and the absence of constitutional symptoms should serve to prevent confusion. Frequently there are other manifestations of tuberculosis elsewhere on the body (scrofuloderma and tuberculides), and the patients usually react to tuberculin. MacKee and Rosen's case presented typical lesions of both erythema induratum and generalized papulo-necrotic tuberculide. The disease is to be differentiated from erythema nodosum and tertiary syphilis. Erythema nodosum is an acute affection, the nodules develop on the shins, and are very tender and painful. There are more or less associated fever and joint pain, and the disorder is of relatively brief duration. Syphilitic gummata are usually single, asymmetrical, and responsive to antiluetic treatment. There are also generally present other signs of the disease. In doubtful cases recourse may be had to a serum or luetin test.

Prognosis.—The malady is a persistent one, prone to relapses and recurrences.

Treatment.—Rest, with elevation of the affected parts, is a valuable measure. Fordyce and MacKee record encouraging results from the injection of tuberculin. Tonics, particularly cod-liver oil and

circulatory stimulants (strychnia, in small amounts), generally are indicated. The ulcerated lesions should be cleansed and dressed daily with an antiseptic powder, such as thymol iodide. F. S. Burns in one instance cured an attack in a few weeks by curetting out the strikingly deep necrotic tissue when the wounds healed surprisingly quickly, leaving only slight scarring. I have found a cotton elastic bandage, which contains no rubber, a valuable aid in the treatment of these cases.

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LUPUS ERYTHEMATOSUS.

Synonyms.—Ulerythema centrifugum; Seborrhea congestiva.

Definition.—An acute or subacute, inflammatory disease characterized by the occurrence of pinkish or reddish patches of various sizes and shapes which on subsiding usually leave thin, whitish, atrophic scars.

Symptoms.—Clinically, lupus erythematosus may be circumscribed *(discoid)* or disseminated *(lupus erythematosus disseminatus).* The former is by far the more common type. In this variety the lesions, which are fairly well-defined, macular or slightly elevated, dry, pinkish or reddish patches, vary from the size of a pinhead to that of the palm, and are covered with small, grayish, adherent scales. They develop insidiously. The sites of predilection are the face, particularly the flush areas of the cheeks, the bridge of the nose, the lobes of the ears, the mastoid area, and the scalp. The skin is but slightly infiltrated. On the cheeks the lesions are often symmetrically placed, and not infrequently a narrow, irregular, band-like lesion develops on the bridge of the nose, and ultimately spreads to the areas on the cheeks, giving rise to a peculiar, but typical, butterfly-shaped eruption. The patches increase in size by both peripheral extension and coalescence. Atrophic changes are characteristic of the disorder, and are most conspicuous in patches of long standing. In these lesions the inflammation is principally marginal, the central areas being thinned and colorless, with numerous dilated, gaping, follicular orifices. Oc-

casionally the mouths of the follicles are filled with corneous material, and the dilatation becomes apparent only after the removal of these horny plugs. On the scalp also the follicles are primarily involved. Rarely the eruption may be confined entirely to this region. The patches are, as a rule, sharply defined and consider-

Fig. 580. - Lupus erythematosus disseminatus. (Courtesy of Dr. W. T. Lindley.)

ably thickened, and scar-formation, with associated alopecia, is an almost invariable sequel.

The mucous membranes are involved in about 25 per cent of all cases (Thos. Smith). The resulting lesions may consist only of slight thickening, with duskiness and scaliness of the affected part, or some abrasion of the surface may be present. The mucous sur-

PLATE VIII.

Lupus Erythematosus, showing characteristic distribution of lesions.

faces which are most commonly attacked are those of the lips, eyelids, cheeks, and tongue. Healing is followed by atrophic thinning and partial loss of color. Subjective symptoms are nearly always absent. On the dorsal surfaces of the hands, one of the most frequent extracapital locations of the disease, the lesions are smooth and but slightly infiltrated, and bright red in color. The palms are rarely involved. In regions where the subcutaneous connective tissue is slight in amount, as the pinnacle of the ear, and the fingers, the eruption may simulate chilblain (lupus pernio), and as both dis-

Fig. 581.—Lupus erythematosus in a negress. (Courtesy of Dr. J. B. Shelmire.)

orders are liable to develop in individuals who are the victims of "chilblain circulation," differentiation would be difficult were it not for the concomitant occurrence of lupus erythematous patches on other parts of the body, particularly the cheeks.

Lupus erythematosus disseminatus is a more acute, as well as a more serious variety of the disease than the localized or discoid form which has just been described. The lesions vary from 1 to 10 cm. in diameter, and are usually superficial, and bright red in color. Occasionally they are nodular, vesicular or bullous in character, and they may bear a striking resemblance to the eruption occurring in

some types of erythema multiforme. In his Paris thesis Pernet gives a detailed account of ten cases of this variety of the disorder (including one case of his own). The regions commonly involved are the face, and the dorsal surface of the hands and feet, but practically no part of the body is exempt. The mucous membranes are frequently attacked. The lesions may come out in crops, some of

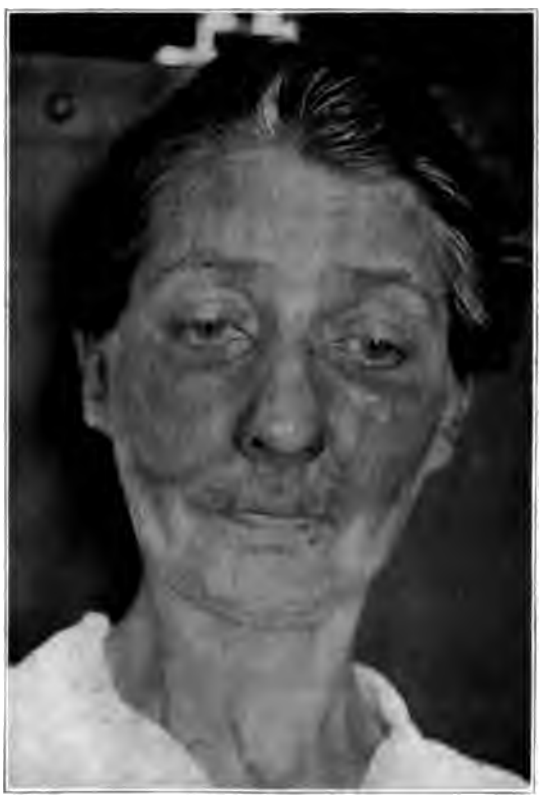

Fig. 582.—Chronic lupus erythematosus of the face, showing characteristic distribution.

the patches persisting indefinitely, and others disappearing spontaneously, with little or no scarring, only to be replaced from time to time by new patches. Hallopeau has reported one example in which the eruption simulated granuloma fungoides in the erythematous stage, Ormsby two in which the skin manifestations presented a typical erythema multiforme aspect, and Stelwagon a comparatively benign case in which the eruption partook of the characteris-

Fig. 583.—Lupus erythematosus. (Courtesy of the U. S. Public Health Service, Immigrant Hospital, New York, N. Y.)

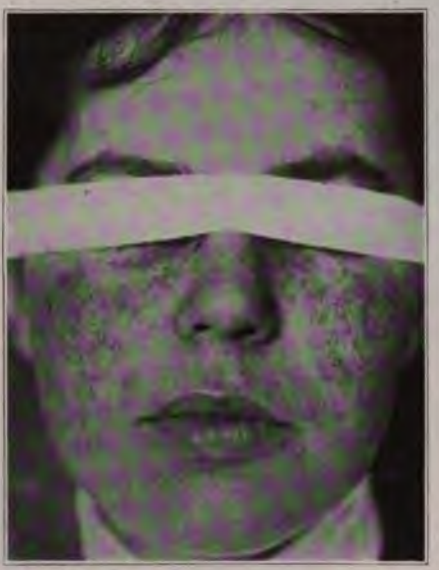

Fig. 584.—Lupus erythematosus.

Fig. 585.—Lupus erythematosus. (Courtesy of Dr. A. L. Anderson.)

Fig. 586.—Lupus erythematosus, in a Cheyenne girl of sixteen years. (Courtesy of Dr. Everett S. Lain.)

tics of both lupus erythematosus and erythema multiforme. I have encountered an instance of the latter type, the patient being a young girl of 16, under the care of Drs. Fredenall and Chalkley, of Lexington, Mo. The eruption involved the face, scalp, hands, forearms, feet, and legs. Three of the lesions on the face had undergone involution, with the formation of thin, atrophic cicatrices. On the hands and feet the eruption consisted of small, slightly elevated, erythematous plaques, and small bullae. The buccal mucosa was involved. The patient succumbed, a few weeks later, to acute pulmonary tuberculosis, not a rare occurrence is cases of this type. In this case, as in many of the disseminated variety, the course of the

Fig. 587.—Lupus erythematosus disseminatus in a boy of seven. The lesion on the lip is impetiginous. (Courtesy of Dr. J. E. Lane.)

lesions was extremely erratic, and both itching and burning were present.

Etiology.—The cause of lupus erythematosus is unknown. Circulatory disturbances and trauma are the main predisposing factors. As a rule, it appears at some time between the second and fourth decades of life. The majority of the discoid, and practically all of the disseminated, cases that have been reported have occurred in women. Repeated attempts to prove definitely the disorder tuberculous or paratuberculous in nature have thus far been unsuccessful. The fact that examples of the disorder are extremely rare in sanitoriums for tuberculosis in Colorado and elsewhere (Markley) is

a point in favor of its non-tuberculous nature. Roth found other evidence of tuberculosis in 70 per cent of a series of 250 cases which he investigated; Boeck in about 60 per cent, and Fordyce and Holder in several instances. Roth concluded that the affection was probably a tuberculide, and the occasional presence of other paratuberculous manifestations (as demonstrated in cases exhibited by MacKee, Fordyce, and others) tends to support this view, although I must agree with Weiss and Singer that no evidence has been presented as yet that shows a direct relationship between this type of lupus erythematosus and tuberculous infection or tuberculous disease. The consensus of opinion at this time indicates that the acute, dissem-

Fig. 588.—Lupus erythematosus in a negro.

inated form of lupus erythematosus is frequently, if not invariably, tuberculous in origin, but that the discoid variety is probably the result of a toxemia, which may be due to the absorption of certain products emanating from any one of several sources.

Pathology.—The nature of the histologic changes is a matter of controversy. The disease process is confined mainly to the corium, the epidermis being involved only secondarily. Robinson believes the disorder to be a local infective process, a granuloma, in which the new growth, which is reticular in structure, is closely connected with the lymph channels. Fordyce and Holder found the primary changes to be located in the blood vessels, and concluded that the

process was an infiltrative one (small, round-cells), followed by degeneration of the collagenous tissue, and subsequent atrophy. Freshwater states that the earlier changes occur in the blood vessels which become dilated. This is followed by perivascular infiltration, with more or less interference with circulation, and blocking of the vessels. Subsequently, as a result of inflammation and degeneration, with ensuing reparative changes, scarring ensues. Giant cells

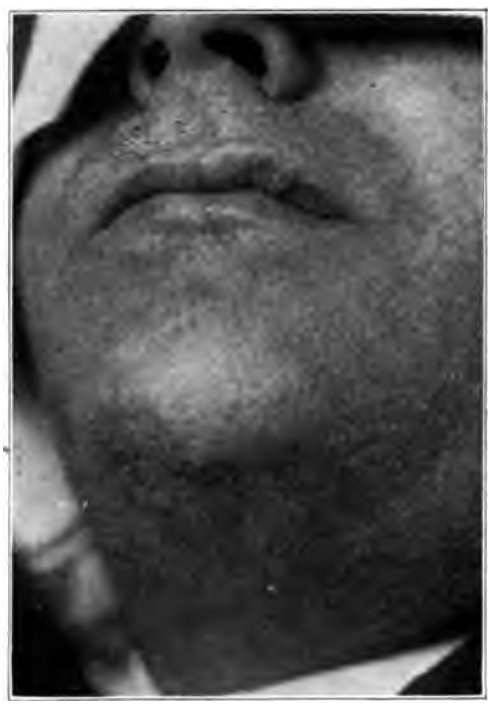

Fig. 589.—Lupus erythematosus of the mucous membrane.

are usually absent. As a result of the long standing hyperemia, the sebaceous glands become hypertrophied, and their ducts become filled with sebaceous matter and débris. Later in the disease, both the sebaceous and coil glands share in the general atrophy.

In lesions of the mucous membranes, Pautrier and Fage found acanthosis, with associated cornification of the outer layers of the epidermis. Throughout the corium there was dilatation of the vessels, with widespread perivascular infiltration (lymphocytes, connective tissue, and plasma cells). In the acute, disseminated form,

the vascular changes are even more pronounced in character, and large numbers of connective tissue and plasma cells are found scattered throughout the upper strata of the corium (mainly in the perivascular regions.)

Diagnosis.—If the characteristic features of the disease are borne in mind confusion is not liable to occur. The well-defined character of the lesions, their history, course, shape, color, consistence and distribution, together with the presence of atrophy, should prevent

Fig. 590.—Lupus erythematosus.

error. In formulating a diagnosis, eczema, psoriasis, seborrheic dermatitis, lupus vulgaris, and syphilis are to be excluded. Eczematous lesions are ill-defined, itchy, moist at some time in their course, and never give rise to scarring. In psoriasis, scale formation is a prominent feature, and when the overlying corneous material is scraped away the characteristic bleeding points are exposed. There is never any scarring, and the eruption is seldom, if ever, confined to the scalp, face or backs of the hands, as in lupus erythematosus. The patches of seborrheic dermatitis are seldom sharply defined, and scarring is never present. Lupus vulgaris generally begins in

childhood. The scars are seldom soft and atrophic, but are usually rough, corded, and conspicuous. The presence of the typical, apple-butter-colored nodules at the margin of the lesion can readily be demonstrated by the aid of a diascope (pressure glass).

Tubercular syphilides commonly give rise to more or less scarring, but the cicatrices are smooth, glossy, and unmarked by patulous gland orifices. The lesions develop rapidly, individual nodules are usually present, and there is a decided tendency toward ulceration. In doubtful cases recourse should be had to a serum, or luetin, or even a therapeutic test.

On the scalp, the disease may simulate folliculitis decalvans, but in this disorder the characteristic redness, and the patulous or stuffed sebaceous gland orifices of lupus erythematosus are wanting.

Prognosis.—The malady is a chronic one, capricious and erratic in its course, with frequent relapses and occasional recurrences. The prognosis in so far as a permanent cure is concerned, should always be very guarded. Occasionally the lesions disappear spontaneously, but as a rule they are very rebellious to treatment, and sometimes new patches develop and the older ones extend despite the employment of the most approved therapeutic measures. As a rule there is more or less scarring. In the discoid variety, the life of the patient is rarely if ever endangered, unless it be by the occurrence of prickle-celled carcinomata which occasionally develop on the cicatrized areas, but in the acute, disseminated form the disease often terminates fatally (usually from systemic tuberculosis).

Treatment.—The remedies that have been recommended in the treatment of lupus erythematosus are legion, a certain indication, as J. C. White has intimated, that none is particularly efficacious or reliable. Arsenic, phosphorus, thyroid, iodide of starch, quinine, ichthyol, salicin and the salicylates, adrenaline, ergotin, digitalis, potassium iodide and belladonna probably stand near the head of the list. Aside from the adoption of a hygienic mode of living, and the employment of some simple tonic, such as cod-liver oil or arsenic, should the patient's general health indicate it, constitutional measures are, as a rule, of little or no value. Coffee, strong tea, highly spiced and indigestible foods, tobacco, and alcohol, especially in the form of beer, are liable to render the disease worse. The main reliance is to be placed on local applications. The choice of these remedies is largely dependent upon the character and amount of inflammation present. In the majority of instances, it will be found

wisest to begin with mild, soothing lotions. The best of these is probably calamine lotion, to which a small amount (.5 per cent) of phenol has been added. In the course of a few days a more stimulating application, such as lotio alba, may be cautiously substituted. Often it is well to employ the calamine lotion in the morning and at noon, and the sulphur mixture at night. Of the several formulae that have been suggested for lotio alba I have found the following most satisfactory:

℞ Zinci sulphatis .....gr. xxx (2.0)
Sulphuris præcipitati,
Potassii sulphureti (recentis).....ʒ i (4.0)
Aquæ rosæ .....q. s. ad fʒ vi (180.0)
Misce et signa: Shake and apply at bed hour.

For a more stimulating effect, an ointment containing sulphur (4 per cent), or sulphur and salicylic acid (10 per cent), may be prescribed for use at night, and the sulphur mixture applied during the day. The patches may be cleansed by means of benzine, applied with a gauze or cotton sponge, or, in the extremely chronic cases, with green soap. Gradually one may work up to the more irritating remedies. Of these, ichthyol (10 per cent), in collodion or in ointments, or weekly applications of pure phenol (George Henry Fox), or of a saturated aqueous solution of lactic acid (Joseph) may be tried. Pyrogallol, arsenic, and similar caustics have been recommended, but I do not consider their use justifiable in so benign a disorder as lupus erythematosus, particularly when the area involved is generally quite extensive, and there is already present the prospect of more or less scar formation. Höllander's "combined method" sometimes proves helpful. The patient is given quinine sulphate, gr. viiss (0.5), three times daily, for a period of from five to seven days. Each evening the lesions are painted with tincture of iodine. At the end of this period the treatment is discontinued until the crusts have become detached. Then, if necessary, another course of treatment is instituted. Linear scarification is sometimes employed, and Dr. George Henry Fox speaks highly of curettage as a therapeutic measure. Of the various local applications that have been recommended, none, in my opinion is so valuable as solid carbon dioxide, as originally suggested by Pusey. The agent is a particularly effective one in indolent cases of the chronic, discoid type presenting dollar-sized and smaller patches. One application, under moderate pressure, for a period of from 20 to 30 seconds, often

is sufficient to eradicate the lesions, and the resulting scar is so slight as to be practically negligible. Simpson has noted pleasing results following the employment of radium. I have found it a valuable aid in several cases of the disease. The exposures should be brief, 8 or 10 mgm. hours, unscreened, or 20 mgm. hours with a 1 mm. silver shield. Wise, King, and others have had success with the Kromayer ultraviolet lamp. The x-rays may be tried in chronic, long-standing examples of the disease. In my hands neither this agent nor the high-frequency current has proved of any value, possibly because of an injudicious selection of cases.

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SYPHILIS.

Synonyms.—Lues; Lues veneris; Pox.

Definition.—A chronic, specific, systemic affection which may be inherited, but is usually acquired, and which always develops as a result of infection with the spirocheta pallida.

For descriptive purposes the course of the malady may be conveniently divided into several so-called stages: (1) a primary stage, which commences with the appearance of the chancre and ends with the development of the generalized cutaneous eruption; (2) a secondary stage, which covers the exanthematous period, and persists until the disappearance of the active manifestations of systemic involve-

ment; (3) a tertiary stage, characterized by the development of circumscribed, gummatous lesions which in some respects resemble those of tuberculosis and leprosy; and (4) a para-syphilitic, or quarternary, stage, which may occur late in the disease, and is marked by the occurrence of grave, neuronal degenerative changes of the central nervous system (including tabes dorsalis, general paralysis, and other chronic disorders).

THE CHANCRE.

Synonyms.—Initial sclerosis; Hard-chancre; Hunterian chancre.

The chancre, or primary lesion of syphilis, develops at the point of inoculation, usually from two to six weeks after infection, and varies greatly in size and in configuration. It may consist of a slightly infiltrated abrasion of the skin, covered with tenacious, stringy mucus, a pea-sized, flattened, indurated, scaly papule, a small, circumscribed ulcer, with elevated indurated borders, and a smooth, glistening, red floor, half hidden by a layer of sticky, adherent mucus, or a large, rounded, nodular and occasionally eroded mass which might readily be mistaken for a carcinoma. Lesions of the last named type are not uncommon on the lip. Usually, they are single, but may be multiple; as in a case reported by E. Zeisler. Chancres may be single or multiple, genital or extra-genital, and pure or mixed in character. As a rule they are single, and the sites of predilection are the glans, the corona, and the shaft of the penis in the male, and the labia and the external os in the female. The most frequent extra-genital locations are the lips, the mouth, and the hands (especially of medical men, dentists, and nurses). In a recent paper, Cole reported sixty-one cases of extra-genital chancre. Of this number, the primary lesions had developed on the lips in forty-three instances, and on the hand in ten. Shaffner has recently described a chancre of the eyelid. "Mixed chancres" are lesions which develop as a result of infection with both the spirocheta pallida and the Unna-Ducrey organism of chancroid. They are of rather common occurrence, and are

Fig. 591.—Chancre of eyelid. (Courtesy of Dr. Phillip Shaffner.)

Fig. 592.—Chancre. (Courtesy of Drs. Fordyce and MacKee.)

Fig. 593.—Chancre. (Courtesy of Drs. Fordyce and MacKee.)

Fig. 594.—Chancre of penis, with widespread edema.

Fig. 595.—Chronic induration of prepuce, following chancre. (Courtesy of Dr. Otto Leslie Castle.)

Fig. 596. Chancre of penis, a typical lesion. (Courtesy of Drs. Fordyce and MacKee.)

characterized by a markedly inflammatory aspect, a tendency to extensive ulceration, and early and painful involvement of the associated lymphnodes. In many instances it is impossible to reach a definite conclusion regarding the nature of the disorder without resorting to a

Fig. 597.—Chancre of lip, with associated macular eruption. (Courtesy of Dr. H. C. Varney.)

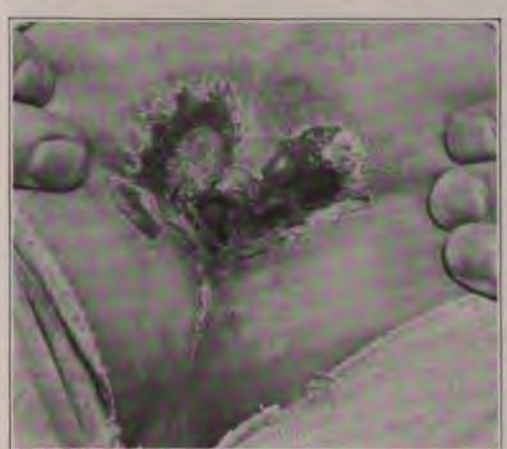

Fig. 598.—Multiple chancres of the anus. (Courtesy of Dr. Frank J. Hall and Dr. Otto Leslie Castle.)

Fig. 599.—Chancre of chin.

microscopic examination of material from the lesion, or until the appearance of the generalized exanthem, or a positive Wassermann reaction.

The chancre is to be differentiated from chancroid, herpes, and

Fig. 600.—Chancre of lip. (Courtesy of Dr. Otto Leslie Castle.)

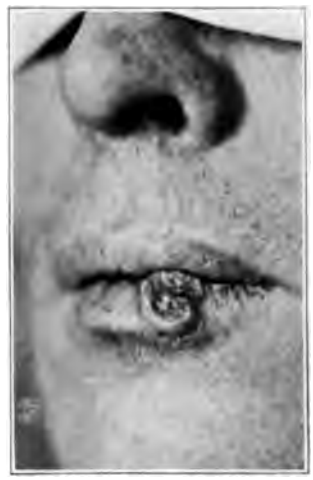

Fig. 601.—Chancre of lip.

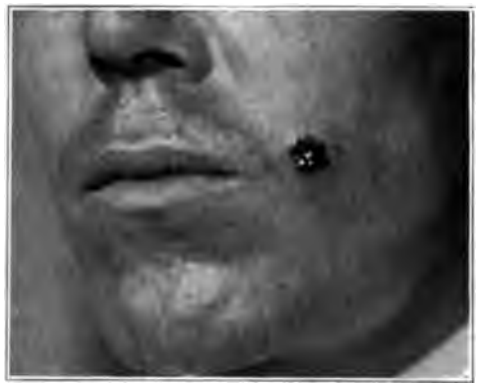

Fig. 602.—Chancre of cheek, following a bite. (Courtesy of Dr. Otto Leslie Castle.)

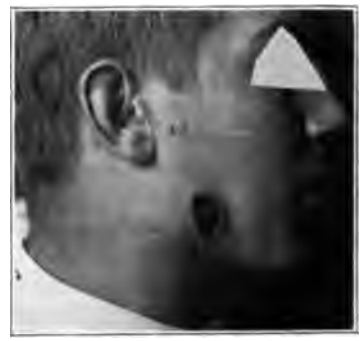

Fig. 603.—Chancre of face, following bite. (Courtesy of Dr. Otto Leslie Castle and Dr. Frank J. Hall.)

carcinoma cutis. The non-inflammatory, indolent character of the syphilitic lesion, together with the long period of incubation, the induration, the absence of pain, and the lack of response to local medi-

cation all are more or less characteristic. In case of doubt, recourse may be had to a microscopic examination of a drop of serum from the lesion. If laboratory facilities are not available, it is wise to await the development of the generalized eruption before making a final decision. In rare instances the initial lesions of syphilis may persist for a long time, as in a case seen by Harris.

Lymphnode Involvement.—The presence and extent of lymphnode involvement in lues have been investigated by Friedlander, Berg, and others. The nearest associated nodes are affected first, later there is more or less involvement of the visceral as well as the subcutaneous

Fig. 604.—Chancre of cheek following bite. (Courtesy of Dr. Phillip Shaffner.)

nodes all over the body. The collections of lymphoid tissue become palpable early in the course of the disease (from the fifth to the tenth day), and are appreciable to the touch as smooth, firm, oval, pea- to nut-sized subcutaneous masses which are painless and freely movable and never tend to break down or to become adherent. The involvement is usually symmetric, and Friedlander found enlargement of the epitrochlear, occipital, and posterior cervical nodes of greatest import. Too much diagnostic value should not be placed on the presence of palpable lymphnodes, however, especially in thin persons and in individuals who are subjects of lymphatism. In obese

persons, on the other hand, great difficulty may be experienced in locating the involved structures, even though they are both swollen and indurated.

Following the appearance of the chancre there is usually a second comparatively quiescent period of several days or weeks (from ten to ninety days, commonly from forty to forty-five days), which is sometimes spoken of as the second incubation period. In addition to the progressive lymphnode involvement, which generally reaches its height at or about this time, certain changes in the blood, characterized by anemia and leucocytosis, are usually present (Hazen). Vague joint pains, headache, and slight fever, with general malaise, are not uncommon accompaniments.

THE SYPHILODERMATA.

Synonyms.—Syphilitic eruption; Syphilides.

General Symptomatology.—The cutaneous manifestations of syphilis vary greatly in character and in appearance. The eruption may be of a macular, papular, vesicular, bullous, pustular or mixed type, and as a result of secondary changes the lesions may closely simulate those of many other systemic diseases which involve the skin. Despite this imitative faculty, however, the syphilodermata possess certain peculiarities, which, when considered collectively, are usually sufficiently distinctive to render recognition easy.

Syphilitic eruptions generally develop slowly and in successive crops, which, owing to the tardy disappearance of the preceding lesions, often tend to overlap. The polymorphism resulting from this multiplicity of eruptive forms is very characteristic. During the earlier exanthematous stages the distribution of the lesions is usually more or less symmetric, but later, and especially in relapsing cases, the eruption is often scanty, and may involve only certain small areas, favorite sites being the nasolabial folds, the palms, and the upper margin of the forehead. In the later stages, the lesions exhibit an even greater tendency to grouping, and serpiginous, gyrate, and crescentic forms are extremely common. They are usually yellowish or reddish in hue, but in the later stages may assume a brownish-red or coppery color. Often there is a complicating seborrheic dermatitis, the resulting lesions being greasy, scaly, and of a yellow-

Fig. 605.—Maculopapular syphilide of trunk.

Fig. 606.—Iritis, with ulceration of eyelids and of lips in secondary syphilis. (Courtesy of Drs. Fordyce and MacKee.)

Fig. 607.—Macular syphilide of palm.

ish or brownish tint. The "mottled chin," which has been so accurately described by Trimble, is a result of the concomitant presence of these two disorders. Other attendant symptoms, aside from the generalized lymphnode involvement, are cephalalgia, laryngitis and pharyngitis, eroded papules, or mucous plaques, in the mouth, and in the vagina in women, and, occasionally, iritis. On the scalp

Fig. 608.—Syphilitic alopecia of eyebrows.

Fig. 609.—Syphilitic alopecia, showing characteristic "moth-eaten" appearance.

the malady may give rise to toxic alopecia of varying degree. The hair loss may be general, as in the case reported by Loyd Thompson, but it is usually patchy and ill-defined, the lesions being mangy and moth-eaten in appearance. The remaining shafts are dry, lusterless and dead-looking. Complete regrowth usually takes place. Tertiary or gummatous lesions of the scalp frequently give rise to more or less

ulceration, with ensuing cicatrization. In these instances the follicles are destroyed, and the resulting alopecia is permanent in character. To the average layman, syphilitic alopecia is a dreadful bugbear. In reality, the symptom very seldom gives rise to marked disfigurement, and its presence is usually discovered by accident, or during the course of a careful general examination.

The nails may be affected at any stage of the disease. In physicians and in nurses the margin of the nail-bed of the right forefinger is a not unusual site for the development of primary lesions, as Bulkley, Montgomery, and others have shown. During the later stages, papule formation and infiltrative changes may occur in the nailbed, with ultimate degeneration, thickening and deformity of the over-

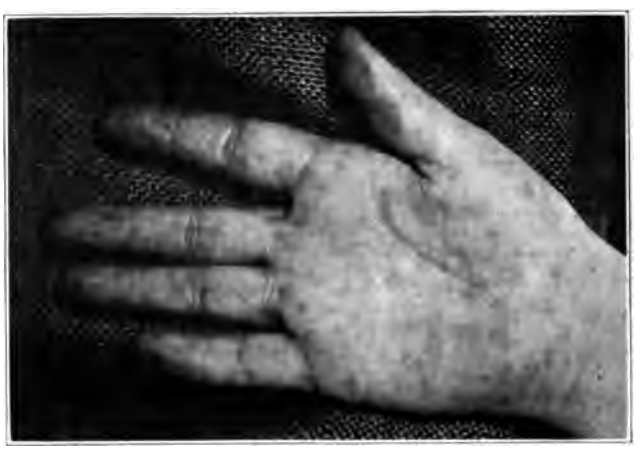

Fig. 610.—Maculopapular syphilide of palm.

lying appendage. Or the inflammation may be periungual in character, and a dry, inflammatory or ulcerative paronychia result. One or more nails on either the fingers or the toes, or both, may be involved.

Syphiloderm Maculosum (Macular syphilide; Roseola syphilitica; Erythematous syphiloderm).—This is the earliest of the so-called secondary manifestations, and in many respects corresponds in character with the symptomatic toxic roseolas which develop in the acute exanthemata. The eruption is generalized and symmetric, and usually appears in from three to six weeks after the appearance of the chancre. The lesions develop quickly and are macular in character, pinkish or reddish in color, and of rounded, oval or irregular contour. They vary from 0.5 to 2 cm. in diameter. The sites of pred-

ilection are the umbilical region, the sides of the trunk, the upper arms, and the palms and soles, although no region is exempt. Areas exposed to slight irritation are apparently more susceptible than non-irritated areas. The central portion of the lesion is the most highly colored, the redness gradually shading into the surrounding normal skin as the periphery is reached. The reddish hue is due sole-

Fig. 611.—Circinate syphilodermata in a negress. (Courtesy of Dr. J. B. Shelmire.)

ly to a localized hyperemia, and disappears readily under pressure, to return promptly when pressure is removed. Owing to the ill-defined character, and delicate coloring of the plaques, they are much more readily appreciable at a distance of one or two meters than when quite close to the eye of the examiner. Grouping is not uncommon, but coalescence rarely occurs. The eruption gives rise to

no subjective symptoms. As a rule the eruption disappears spontaneously, with little or no scaling, in the course of from two to several weeks. Occasionally it is followed by slight, temporary pigmentation. Rarely recurrences are noted, the lesions being scanty in number, segmented or circinate in outline, and located usually on the forearms, thighs and buttocks. Unna has termed these recurrent lesions "neuro-syphilides." They may be scaly, and are often persistent, but are seldom infiltrated.

Fig. 612.—Erythème papuleuse post-érosive ou syphilóide post-erosive, the "Dermite papuleuse disseminée" of Jacquet. (Courtesy of Dr. J. E. Lane.)

Under conditions favorable to the development of the disease, the macules, instead of disappearing, may exhibit a tendency to papule formation, and macules, maculopapules, and papules all may coexist in the same individual.

Diagnosis.—The macular syphiloderm is to be distinguished from the lesions of pityriasis rosea, tinea versicolor, ringworm, drug erup-

tions, and the acute exanthemata. The concomitant presence of the primary lesion (which is usually, but not invariably, discernible), the generalized lymphnode involvement, the presence of sore-throat,

Fig. 613.—Maculopapular syphiloderm. (Courtesy of Drs. A. P. Biddle and R. A. C. Wollenberg.)

Fig. 614.—Pigmentary syphilide of neck.

Fig. 615.—Pigmentary syphilide. (Courtesy of Dr. Frank J. Hall.)

Fig. 616.—Pigmentary syphilide of foot.

and the absence of fever of more than slight degree, all are indicative of syphilis. In pityriasis rosea the lesions are oval or circinate in outline, and are confined to the trunk. Their appearance is usually preceded by the development of a large "mother patch" in the abdominal region, and they are seldom accompanied by symmetric

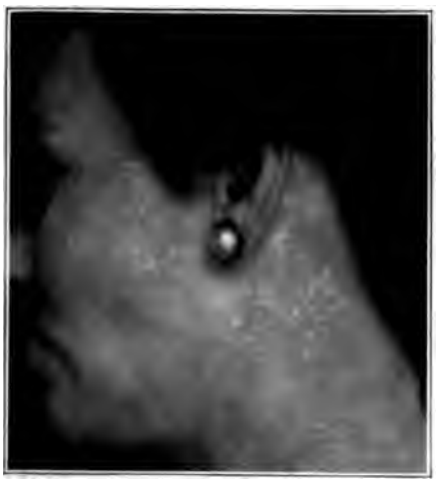

Fig. 617.—Pigmentary syphilide of neck.

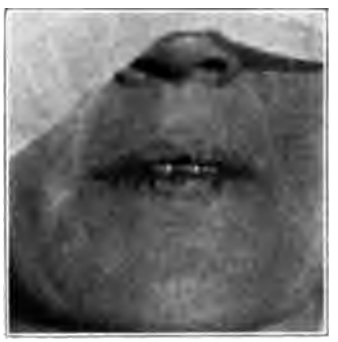

Fig. 618.—Pigmentary syphilide of lip.

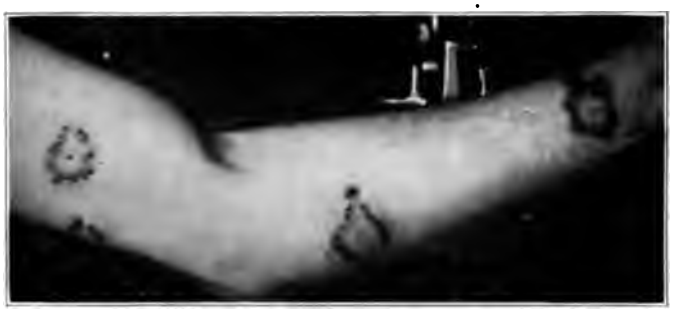

Fig. 619.—Circinate pigmentary syphilide.

lymphnode involvement. In tinea versicolor the eruption is yellowish or brownish in color, and is usually confined to the upper two-thirds of the trunk. The disease is an extremely chronic one, there are no systemic manifestations, and the presence of the fungus can always be demonstrated. Ringworm of the body is characterized by the occurrence of a few or several rounded or oval, asymmetric

patches on various parts of the body and limbs. The fungus can usually be found without difficulty. In the acute exanthemata the eruption commonly appears first on the forehead or face. There is no general lymphnode involvement, or history of a primary lesion, and the temperature curve is high (usually over 101° F.). Of the various drug rashes, those due to copaiba, belladonna, and the opiates are the most suggestive. In addition to the history in these cases, the scarlet redness of the lesions, together with the intense itching, and the absence of other manifestations of syphilis, should serve for differentiation.

Syphiloderma Pigmentosum (Pigmentary syphiloderm; Leucoderma syphiliticum).—Discoloration of the skin, as a result of the deposition of blood pigment, is not unusual in syphilitic lesions. True

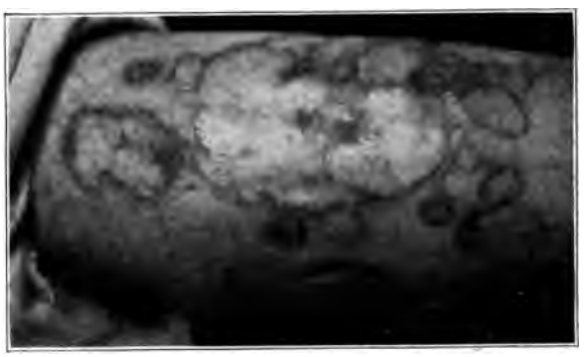

Fig. 620.—Pigmentary syphilide of leg.

dyschromia, however, is rare. The so-called *leucoderma syphilitica* is a rare pigmentary disturbance which probably belongs in this category, although its true pathologic nature is as yet unsettled. The lesions are usually located on the back and sides of the neck (although they may involve the genital or other regions), and consist of pinhead- to pea-sized or larger, rounded or oval, ill-defined, pigment-free patches, with hyperpigmented areolae. The resulting mottled appearance of the areas is striking, particularly in dark-skinned individuals. The majority of the cases occur in young women, especially brunettes, and the disorder commonly develops toward the end of the first year of the disease, or later. Its duration varies from several months to several years, and in most instances its course is wholly uninfluenced by antisyphilitic treatment. The eruption gives rise to no subjective symptoms. Its location, together with its

symmetric distribution, and the concomitant presence of other manifestations of lues should serve to differentiate it from tinea versicolor, and vitiligo.

Syphiloderma Papulosum (Papular syphilide; Papular syphiloderm)—For purposes of description, syphilodermata of the papular type may be conveniently divided into several distinct groups: (1) The small acuminate miliary papular (or follicular) syphiloderm; (2)

Fig. 621.—Depigmentation following syphilitic ulceration of skin in a negro.

the lenticular papular (or flat papular) syphiloderm; and (3) the papulosquamous syphiloderm.

Miliary Papular Syphiloderm.—This variety is always follicular, and the lesions, which are pinpoint- to pinhead-sized, firm, acuminate or rounded, reddish papules, develop in crops, and usually appear about the twelfth or fifteenth month of the disease. The distribution may be general, but the lesions tend to grouping, and are gen-

erally most abundant on the upper part of the trunk and arms. The thighs also are a not infrequent site, and occasionally the face is attacked. Not infrequently the eruption is mixed in character, a few of the lesions presenting summit vesiculation or even pustulation, and considerable numbers of large flat-topped papules commin-

Fig. 622.—Miliary papular syphilide. (Courtesy of Dr. Otto Leslie Castle.)

gling with those of the small or large, acuminate type. The lesions are reddish or brownish in color, and somewhat infiltrated, and their presence gives rise to no subjective symptoms. There is associated lymphnode involvement, and usually an accompanying pharyngitis of variable degree. In the moist areas (genital and anal regions) the papules tend more to the larger, lenticular type, and the buccal mucosa is commonly the site of a few, or many, mucous patches. Af-

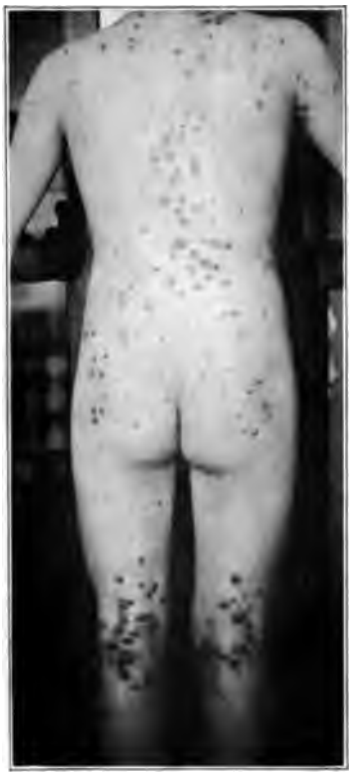

Fig. 623.—Large papular syphilide, developing nine weeks after appearance of chancre.

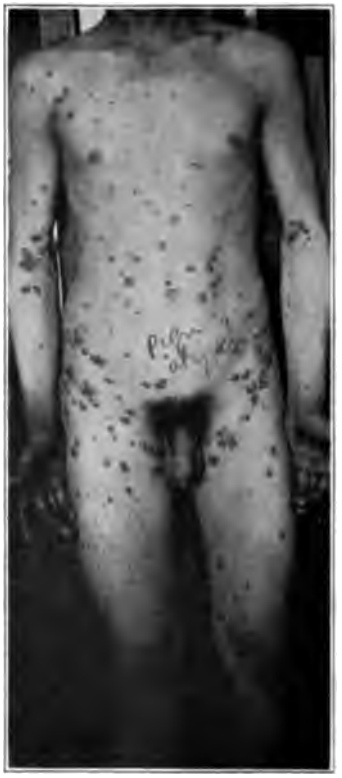

Fig. 624.—Large papular syphiloderm.

ter persisting for a few weeks or months, the lesions gradually disappear spontaneously, usually with more or less temporary scaling, often with some pigmentation, and occasionally even slight scarring. The eruption is less responsive to treatment than many of the other syphilodermata, and recurrences, usually in the form of circinate or segmental groups, are not uncommon.

Diagnosis.—The lesions are to be differentiated from those of keratosis pilaris, lichen planus, pityriasis rubra pilaris, and eczema. None of these disorders is accompanied by symmetric enlargement of the lymphnodes, or mucous patches in the mouth or pharynx. In keratosis pilaris the papules are grayish in color, pointed and graterlike, and are usually confined to the outer aspect of the arms and thighs. The papules of lichen planus are purplish or violaceous in hue, and intensely itchy, and are often confined to the inner surface

Fig. 625.—Papulopustular syphilides in a neglected case of lues. (Courtesy of Dr. Otto Leslie Castle.)

Fig. 626.—Maculopapular syphilides, involving the follicles. (Courtesy of Dr. L. W. Ketron.)

of the thighs and the flexor surface of the wrists. In pityriasis rubra pilaris there is usually more or less scaling, especially of the scalp, and the lesions on the trunk and limbs never tend to become vesicular or pustular, but may increase in size by coalescence. Eczema is distinguished by the intense itching which is usually present, the bright red color and ill-defined character of the patches, and the occurrence of vesiculation and oozing at some period of the disease. The eruption of psoriasis guttata may bear a superficial resemblance

to syphilodermata of this type, but in psoriasis the lesions are not follicular, and they almost invariably exhibit a strong predilection for the extensor surfaces of the extremities. The scales are pearl-colored, and when forcibly removed leave one or more tiny, hemorrhagic points.

THE LENTICULAR PAPULAR SYPHILODERM.—This variety may develop closely following the macular eruption, and not uncommonly the two types of lesions are intermixed. The papules are pinhead- to bean-sized or larger, and brownish or reddish in color, with a smooth, shining surface which later may become covered with a thin, grayish, transparent scale. The larger ones are generally flattened and nummular, and are sometimes referred to as *discoid papular syphilodermata* (George Henry Fox). Lesions of the lenticular papular variety may occur on all parts of the body, but the sites of predilection are the forehead, the face (especially the buccal commissures and the nasolabial folds), and the genitals. They may be discrete or grouped, but seldom coalesce. Pustulation, with the formation of papulopustules, may supervene, especially on the scalp, but polymorphism is less characteristic of this variety than of the miliary papular syphiloderm. The flattish, discoid lesions sometimes exhibit a marked tendency to scaling, with resulting formation of psoriasis-like patches *(papulosquamous syphilodermata)*. Lesions of this type *(squamous syphilodermata*, or as they are occasionally and unfortunately, termed "syphilitic psoriasis"), are fairly common on the palms and soles in the later stages of the secondary period (from one to two years following infection). The papules, which are dark red in color, and much infiltrated, may present only a film-like collarette of thin, dry, grayish scales, but as a rule the collections of cutaneous débris are rather thick, and closely adherent to the summits of the lesions. An occasional papule of this type may occur as a part of the generalized eruption, but in the majority of instances the eruption is a late or relapsing one of limited distribution. Serpiginous, and especially ring-like, configuration is not unusual, particularly in members of the colored race (H. Fox, Hazen). Concentic and gyrate lesions may develop as a result of the grouping and coalescence of individual papules, or from the enlargement and central involution of a single, discoid plaque (Hazen). The face, scalp and neck are the most frequent sites for lesions of this type. In this variety of syphiloderm the eruption develops quite rapidly, in from one or two to several months following the appear-

ance of the chancre, and after being present for from two to six months it generally disappears spontaneously, with some resultant temporary pigmentation. Relapses and recurrences, usually of limited extent, are not uncommon.

In the vulvar and anal regions the lesions become condylomatous, and may exhibit vegetative tendencies.

Fig. 627.—Moist syphilitic papules in the vicinity of the anus.

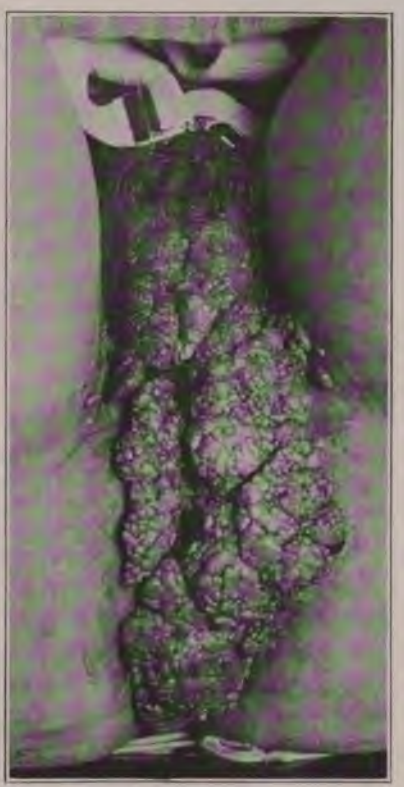

Fig. 628.—Condylomata. (Courtesy of Drs. Fordyce and MacKee.)

The lenticular papular syphiloderm usually responds promptly to antisyphilitic treatment. Lesions of the papulosquamous variety are more persistent, but they too can generally be eradicated with very little difficulty.

Diagnosis.—The character and distribution of the eruption, together with the concomitant presence of other manifestations of syphilis, will usually serve to prevent confusion. Papulosquamous

syphilodermata may resemble psoriatic lesions, but their localized, flexural, asymmetrical distribution, their slighter scaliness, brownish color, and marked infiltration, all serve to distinguish them from the less serious disorder, and the presence of mucous patches, lymph-node involvement, and, often, a specific history, are generally sufficient for recognition.

Fig. 629.—Mucous patches on tongue. (Courtesy of Drs. Fordyce and MacKee.)

Fig. 630.—Cheilitis syphilitica.

MOIST PAPULAR SYPHILODERM.—In certain regions, as a result of heat and moisture, friction and maceration, flat papular syphilodermata may become greatly altered in both size and shape. The resulting lesions may be sharply or indefinitely defined, of soft or firm consistence, and flat, slightly elevated, or papilliform in contour.

The usual sites for the development of moist papules are the genital, anal, and umbilical regions, the axillae, the buccal commissures, the interdigital webs, the opposing surfaces of the toes, and the submammary folds in women. The lesions begin as ordinary flat papules, but very soon, as a result of their environment, they become flattened, macerated, and covered with a thick, tenacious, mucoid exudate. Ultimately, the lesion may assume a plaque-like form, with a moist, whitish surface, and irregular, ill-defined margins, or it may become warty and papillomatous, or even vegetative. Growths of the latter type are not uncommon in the anal and vulvar regions, especially in infected individuals who are not particularly cleanly. Quantities of mucus and purulent matter collect in the interstices of the cauliflower-like masses, and give rise to an extremely offensive, fetid odor. Broad, moist, flat papules (condylomata) in the anal region may be mistaken for hemorrhoids, a clinical fact which was once indelibly impressed upon my mind by my old friend and teacher, Surgeon Gilbert Grunwell, of the U. S. Navy, but the general condition of the patient, and the presence of syphilitic manifestations elsewhere on the body should serve to put one on guard against the commission of so flagrant an error. Verrucose and vegetating syphilodermata are to be differentiated from acuminate verrucae.

Mucous patches are flattened and abraded syphilitic papules. They may form on any mucous surface, and are of particularly frequent occurrence in the mouth, and on the lips, and the anal and vulvar mucosa. The tongue, the gums, and the soft palate also are frequently attacked. The lesions are rounded or oval in outline, flat, slightly elevated, or even somewhat depressed, and grayish or pinkish in color. They are usually covered with an adherent or partially detached, thin, diphtheroid membrane. When this is forcibly removed, a reddened, raw, and often bleeding surface is exposed. Superficial ulceration may occur. The patches are slightly painful, and quite sensitive to the action of hot fluids, acids, and condiments.

Opaline plaques are smooth, rounded, ovoid, or irregular whitish patches which occasionally develop on the tongue, lips, and inner surface of the cheeks. The lesions are especially common in tobacco smokers, and it is probable that irritation from this source has much to do with their causation.

The mucous patches occurring in the mouth must be distinguished from the lesions of aphthous stomatitis, and from herpes. The presence of other symptoms of syphilis, particularly pharyngeal and laryngeal

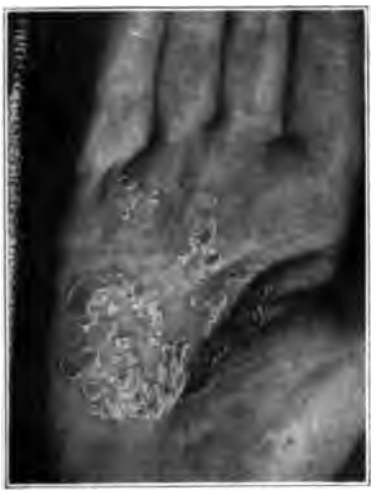

Fig. 631.—Squamous syphilide of palm.

Fig. 632.—Squamous syphilide of palm.

Fig. 633.—Squamous syphilide of palm.

catarrh, and general lymphnode involvement, usually is suggestive of the graver malady. Aphthous ulcers are sharply defined, extremely sensitive, and evanescent in character. Occasionally a recurring case of labial herpes, affecting the mucous membrane, may prove extremely puzzling. In doubtful cases, recourse should be had to a serum test.

SYPHILODERMATA OF THE PALMS AND SOLES.—The palmar and plantar regions are not uncommon locations for the dry syphilodermata, in both the secondary and tertiary stages of the disease. Owing to the thickness and density of the overlying corneous layer, the appearance of the lesions is considerably modified. Macular eruptions of the palms and soles usually occur as part of the generalized efflorescence at this stage of the disease, but both the late papular and the tubercular forms may be more or less localized in these regions, especially in relapsing cases. The lesions are as a rule slightly elevated, and more or less infiltration is invariably present. The color varies from reddish or reddish-brown to purplish, and subjective symptoms, aside from slight stiffening of the part, are absent. Occasionally fissures develop, and these, if deep, may give rise to much pain and discomfort.

Brocq and other French writers have called attention to a peculiar type of eruption (syphilide corné) which is occasionally encountered in syphilis of the palm, and is characterized by the presence of small, hard, sharply circumscribed, horny masses which can be readily picked out with a sharp-pointed instrument. Sometimes the plugs are absent, and only the cavities remain. The resulting worm-eaten appearance of the affected parts is very striking. Lesions of the papulosquamous variety may give rise to much scaling and thickening, but ulceration occurs only in the tubercular (tertiary) cases. The eruption may involve all four extremities, but often it is confined to one or both palms. Secondary seborrheic involvement is not uncommon, the ensuing lesions presenting a yellowish or grayish, glossy appearance which is quite characteristic. The late palmar and plantar syphilodermata are usually rebellious to treatment, and are not very readily amenable to arsenical therapy. As a rule, they clear up promptly under the influence of insoluble mercurial injections, however, especially if the systemic treatment be reinforced by proper local medication. In rare instances, keratoderma may develop, as in Wende's and Baker's cases.

Diagnosis.—Syphilodermata of the palms and soles are to be dif-

Fig. 634.—Syphilitic keratodermia, with pseudo-elephantiasis. (Courtesy of Dr. Grover W. Wende.)

ferentiated from the lesions of psoriasis, eczema, and seborrheic dermatitis. There appears to be a generally accepted belief that psoriasis frequently involves the palms alone, and that the lesions, when they develop in this region, always display the peculiar and striking appearance that is so characteristic of psoriatic eruptions on other parts of the body. In reality, the disease seldom if ever occurs solely on the flexor surfaces of the hands or feet, and in suspected cases which present no evidence of the malady elsewhere,

Fig. 635.—Squamous syphilide of palm.

Fig. 636.—Squamous syphilide of palm. Only the right hand is involved.

the probability of the diagnosis of psoriasis may safely be ignored. In eczema the affection is usually bilateral, and the lesions present an inflammatory aspect and are at times intensely itchy. Often there is a history of vesiculation and oozing, and fissuring is the rule rather than the exception. The lateral surface of the fingers, and the dorsa of the hands also may present active manifestations of the disease. Because of the frequency with which syphilis and seborrheic dermatitis are associated in these regions, the diagnosis is often fraught

with difficulties. In seborrheic dermatitis the lesions are yellowish in color, and superficial in location. There is generally an associated inflammation of the scalp, and often of the sternal and interscapular regions, with more or less seborrhea of the face. The tendency to circinate and serpiginous configuration is not so common in seborrheic dermatitis as in syphilis. In the latter malady the history may be of service in enabling one to reach a conclusion, but the information gained from a serum test is by far the most valuable of all.

Fig. 637.—Squamous syphilide of palm. Note tendency to form serpiginous figures.

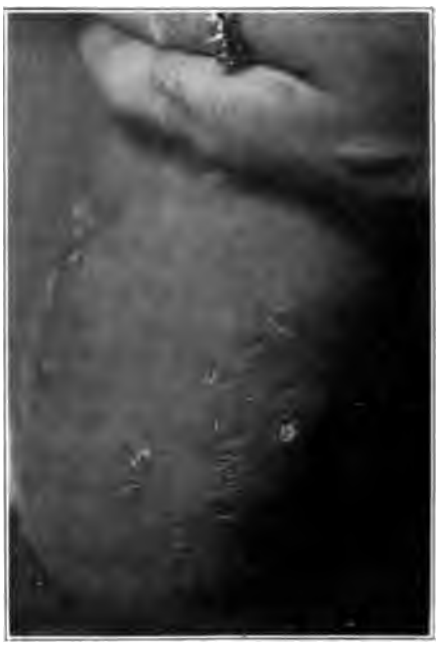

Fig. 638.—Syphilis cornée of the heel.

Syphiloderma Vesiculosum.—Transitory summit vesiculation occasionally occurs in acuminate papular syphilodermata which are becoming pustular, but true vesicle formation in syphilis is exceedingly rare. The lesions may be discrete, symmetric and generalized (varicelliform syphiloderm), or they may exhibit a tendency toward grouping (herpetiform syphiloderm). The vesicles usually develop slowly, and possess firm, infiltrated, papular bases. On disappearing they give rise to more or less brownish pigmentation, but seldom if ever any scarring.

Syphiloderma Pustulosum.—Pustular syphilodermata are far less

common than those of the papular variety. As in the latter, however, the lesions may be separated into groups according to their size and shape. Persons whose resistance to staphylococcic infection has been lowered by disease or starvation are far more susceptible than nor-

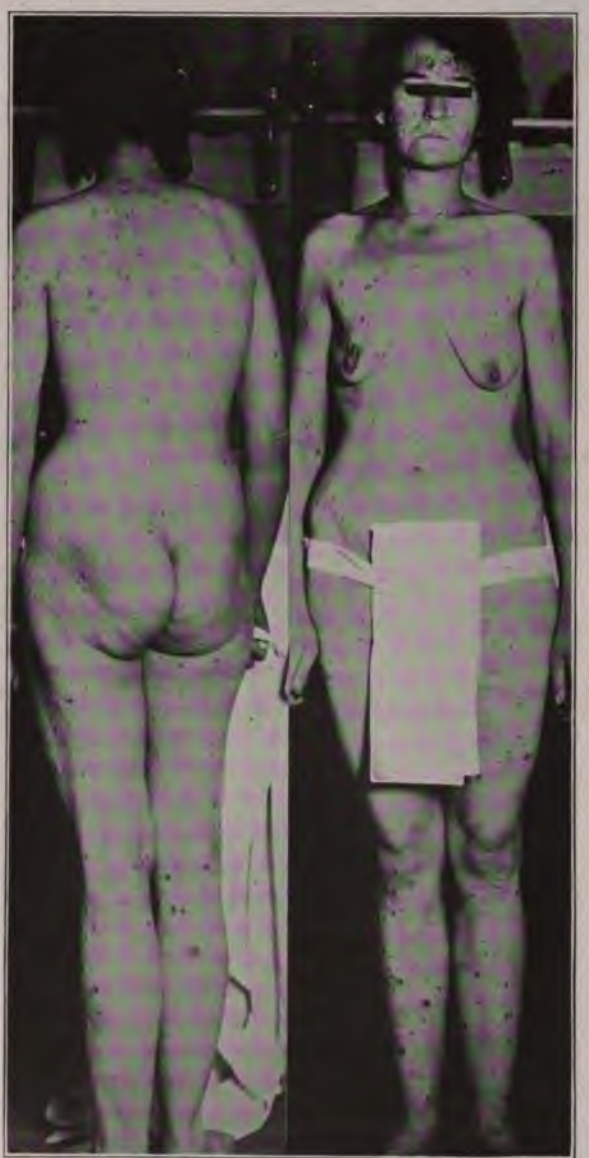

Fig. 639. Fig. 640.

Figs. 639 and 640.—Pustular syphilis. (Courtesy of Dr. Otto Leslie Castle.)

mal individuals to this type of eruption. Gottheil has reported a case of nodulo-pustular syphiloderma, which closely simulated folliculitis nasi; and Pardee one in which the eruption resembled tuberculide.

Small Acuminate Pustular Syphiloderm.—In this variety the lesions, which are generally follicular, are of minute size, and often develop as a complication in ordinary acuminate papular syphilo-

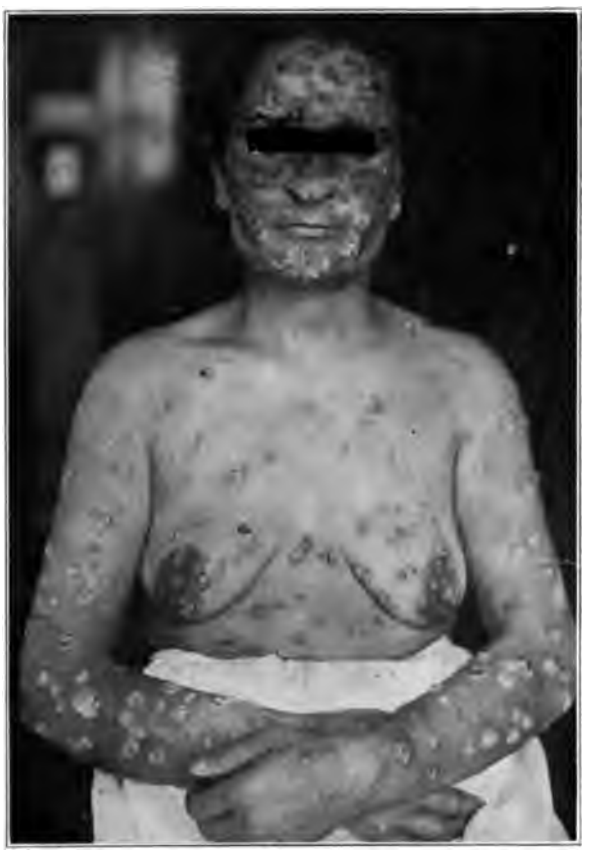

Fig. 641.—Pustulosquamous syphilide. (Courtesy of Dr. H. B. Savage.)

dermata. The pustules may become confluent, but are usually discrete, and quite numerous, and symmetrically distributed over the trunk and extremities. They usually appear with, or shortly following, the papular eruption, at some time during the first few months of the disease. Not uncommonly they occur during relapses, especially in cases which have been insufficiently or indifferently treated. The individual lesions are cone-shaped, and their summits occasionally are umbilicated. They develop slowly and may persist for several

weeks. Ultimately the collections of pus undergo desiccation, with the formation of loosely adherent, reddish-brown crusts. On disappearing they generally leave temporary stains, and occasionally slight scars.

Large Acuminate Pustular Syphiloderm.—In this variety, which is sometimes termed "acneiform syphiloderm," the lesions are pea-sized or larger, discrete, acuminate pustules which are located at the follicular orifices and generally involve the face, trunk, and limbs. The

Fig. 642.—Pustulosquamous syphilide.

eruption may be mixed in character (papules, vesicles and pustules), and is sometimes accompanied by transient elevation of temperature and other temporary manifestations of systemic disturbance. The majority of the pustules are acuminate or conical in shape and reddish in color, with infiltrated bases. Occasionally, a few or all of the lesions may exhibit more or less umbilication, and in some instances this is so marked a feature that the eruption bears a striking resemblance to that of smallpox (varioliform syphiloderm). The lesions usually develop slowly and in crops. They may be grouped,

but as a rule they are scantily or profusely distributed over the major portion of the body. The patients are generally weak, debilitated individuals, and there is usually an accompanying anemia of varying degree. The eruption disappears very gradually in the

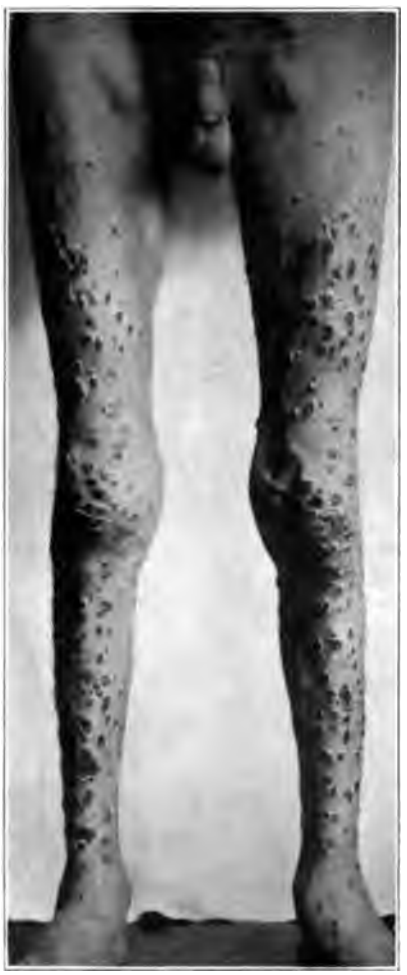

Fig. 643.—Rupial syphilides. (Courtesy of Dr. Otto Leslie Castle.)

course of several weeks or months, and is followed by more or less brownish pigmentation, and occasionally some atrophy and scarring, of the affected areas. As in the small acuminate type, the first regressive change to be noted is desiccation, the ensuing crusts being

thick, rough, brownish, and rather firmly seated on superficially eroded bases.

Diagnosis.—The large acuminate pustular syphiloderm is to be differentiated from the lesions of acne vulgaris, variola, and the various drug eruptions. The distribution and course of the lesions, together with the absence of active manifestations of syphilis elsewhere

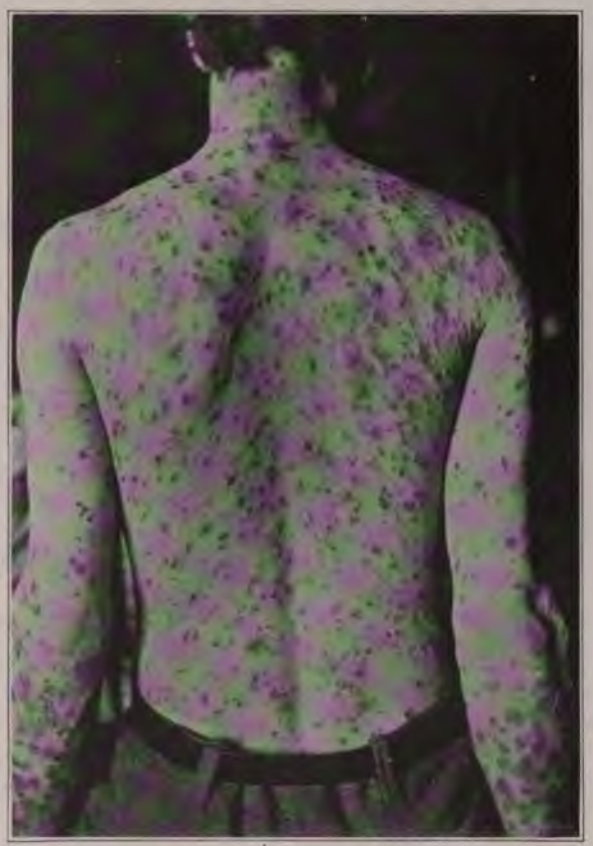

Fig. 644.—Psoriasiform syphilide. (Courtesy of Dr. E. Wood Ruggles.)

on the body, should prevent confusion with acne vulgaris. In smallpox the pustules are deeply seated, and umbilicated, with thick, firm walls. The eruption develops quickly, in the course of a few hours, and the forehead and the flexor surfaces of the wrists are primarily involved. The symptoms of systemic disturbance are usually severe (fever, headache, and backache), and a history of exposure is often

present. On the other hand, concomitant manifestations of syphilis such as lymphnode involvement, mucous patches, iritis, and positive serum reactions are absent.

Of the drug eruptions which may simulate the pustular syphilodermata, those due to the action of the iodides and bromides are most suggestive. In these cases, the history is important, and this, together with the localization of the lesions (the sites of predilection being the face, chest, and back), and the absence of other symptoms of syphilis should prevent confusion.

Flat, Pustular Syphiloderm.—Lesions of this variety (impetigoform and echthymaform syphilodermata) are flat, pea- to thumb-nail-sized, yellowish or brownish, superficial pustules. On the scalp, trunk, and extremities, the eruption is usually discrete, but on the

Fig. 645.—Syphilis buliosa. (Pawloff and Mamurowsky.)

face, and in the genital and anal regions a marked tendency to grouping is often noted. In the latter localities, polymorphism is not uncommon. The pustules may develop from pre-existing papules, and frequently macules, large acuminate papules, and large, flat pustules may be present at the same time. The crusts are rounded, oval, or irregular in outline, and of varying thickness, and the underlying ulcers are superficial, and but slightly inflamed, or, more rarely, deep and crateriform, with reddish or purplish, congestive areolae. Confluent lesions may give rise to the formation of extensive crusts.

The lesions are to be distinguished from those of pustular eczema and of impetigo contagiosa, neither of which gives rise to ulceration, or is accompanied by other symptoms of syphilis. In pustulo-ulcerative syphilodermata the destructive factor is very pronounced, and the lesions are brownish or purplish in color, with infiltrated bases

and thick, reddish, brownish, or greenish crusts. The cavities are partially filled with bloody, seropurulent fluid. Occasionally, the overlying crustaceous masses are bulky, rough and stratified, or look not unlike the rough, outer surface of an oyster shell (rupia, or

Fig. 646.—Circinate syphilide in a negro. (Courtesy of Dr. H. H. Hazen.)

Fig. 647.—Circinate syphilides of face. (Courtesy of Dr. L. W. Ketron.)

Fig. 648.—Circinate tubercular syphilide of face.

rupial syphilide). Eruptions of the latter type are usually discrete, and the lesions, which begin as maculopapules or as papules, are comparatively few in number, and develop slowly but progressively. They seldom appear before the tenth or twelfth month of the

disease. The sites of predilection are the face and the extremities. There may be some associated pain and tenderness, but the subjective symptoms are remarkably trivial in character. The lesions do not tend to disappear spontaneously, but are usually quite responsive to treatment. They generally give rise to more or less pigmentation, and some scarring.

Bullous Syphiloderm.—This variety, the "Pemphigus syphiliticus"

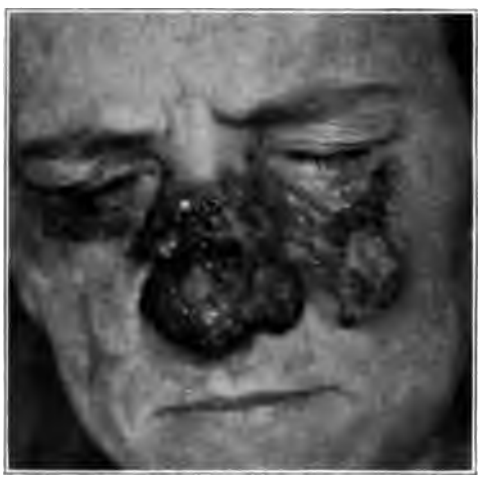

Fig. 649.—Tubercular syphilide of nose and cheek.

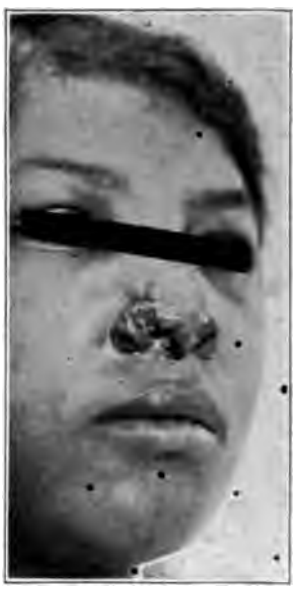

Fig. 650.—Ulcerating tubercular syphilide of nose. (Courtesy of Dr. Virgil McCarty.)

of older writers, is an extremely rare one in acquired syphilis. The lesions develop late in the course of the disease, and are pea- to nut-sized or larger, rounded or oval blebs, partially distended or completely filled with serum or an admixture of serum and blood. The eruption is discrete, and the lesions scanty in number. Many of the bullae have reddened, inflammatory areolae. In the course of a few days pustulation occurs, and ultimately desiccation takes place, with the formation of thick, yellowish, blackish or greenish crusts superimposed on moist, ulcerated bases. As a rule the subjects of eruptions of this type are debilitated, cachectic individuals whose resistance has been lowered by alcohol, illness, or starvation.

Tubercular or Nodular Syphiloderm.—The tubercular syphiloderm

occurs late in the course of the disease, seldom before the end of the first year and usually in the third or fourth, and may be considered both clinically and histologically, as a gumma of the skin (Morrow). Lesions of the tubercular type vary in size from that of a pinhead to

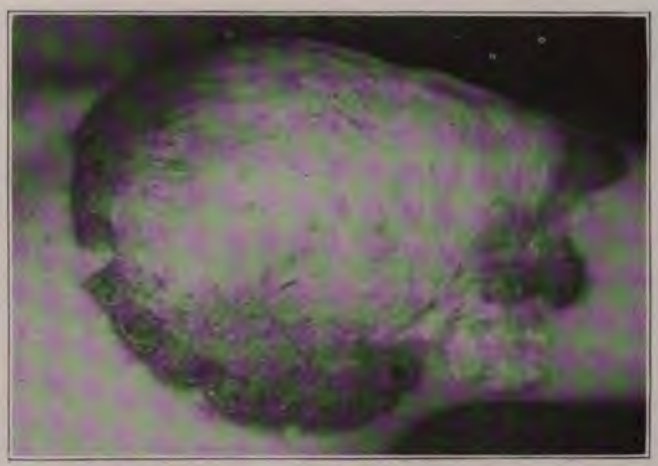

Fig. 651.—Tubercular syphilide of shoulder. Healthy cicatrix in center.

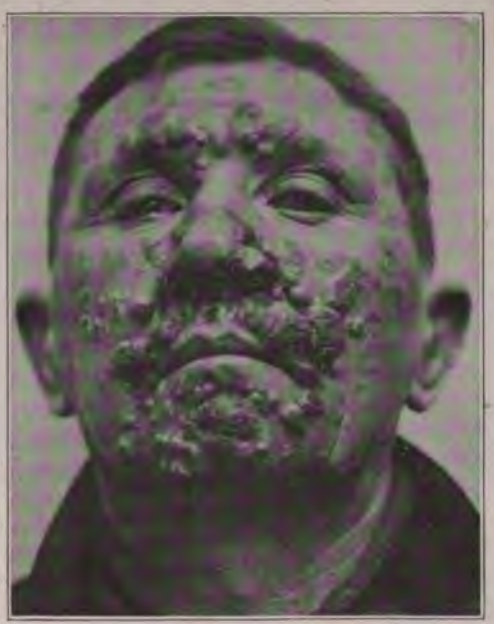

Fig. 652.—Tubercular syphiloderm of face. (Courtesy of Dr. Harold N. Cole.)

that of a large pea. They are usually limited in number, and are seldom of generalized distribution. The sites of predilection are the face, especially the forehead, the scapular and interscapular regions, and the extremities. As a rule, syphilodermata of this variety ex-

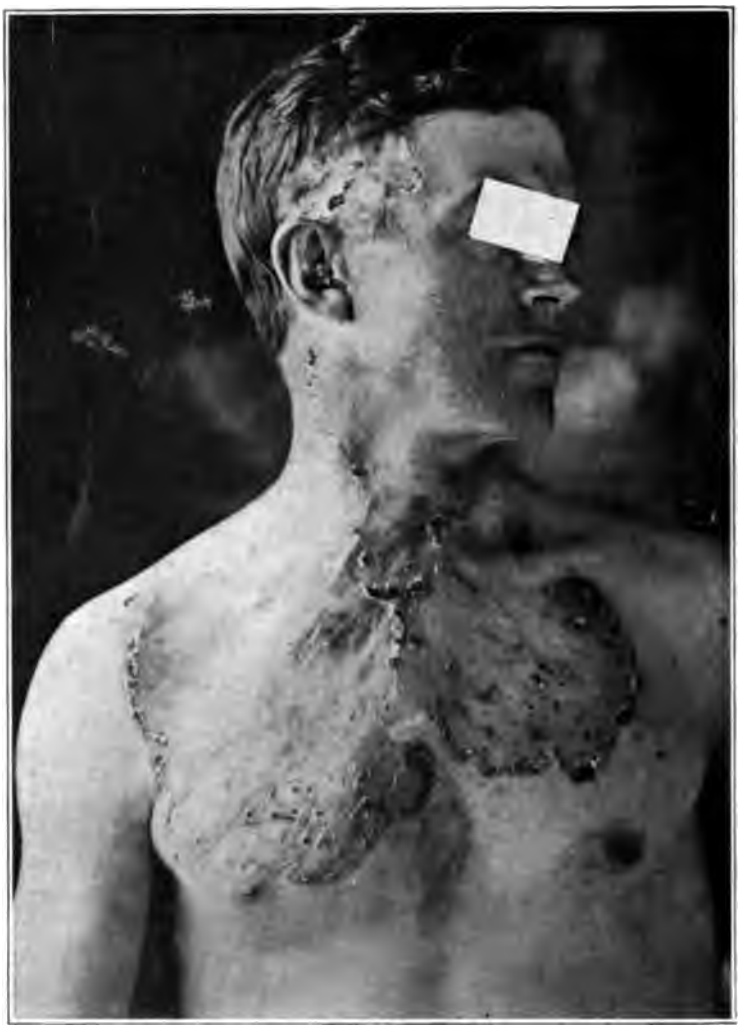

Fig. 653.—Tubercular syphiloderm. (Courtesy of Drs. J. B. Kessler and J. C. Kessler.)

hibit a strong tendency to grouping, and coalescence with the formation of circinate, segmental, and serpiginous patches is not uncommon.

Clinically, syphilitic tubercles are smooth, rounded, circumscribed elevations, reddish or brownish in color, and of firm consistency. The nodules develop slowly, and may persist for weeks or months practically unchanged. Ultimately they either undergo spontaneous involution, or break down and form superficial ulcers. In either case, there is more or less resultant pigmentation and scarring. In the non-ulcerative cases the cicatrices are rounded or oval, whitish and atrophic. In the ulcerative cases they are thin, glazed, and parchment-like, occasionally with some scale formation. In the majority

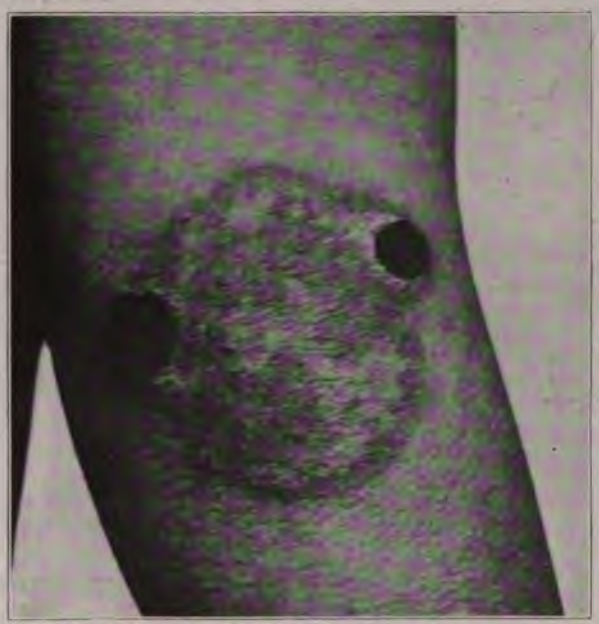

Fig. 654.—The cicatrix marks the site of a gumma which broke down and healed. Later two smaller lesions developed at the points shown. (Courtesy of Dr. J. E. Lane.)

of instances the process is a progressive, although relatively superficial, one. The tubercles disappear, with or without ulceration, but always with some resultant cicatrization. New lesions spring up at the margin of the plaques, and in the course of time, these too undergo regression, only to be replaced marginally by fresh tubercles. In this manner areas of relatively large extent may be covered in the course of years. The scales and crusts are usually loosely adherent, and yellowish or brownish in color. This variety of syphiloderm is commonest in the cachectic and illy nourished, but is met with in

patients in all walks of life. As a rule it is readily amenable to appropriate treatment.

Diagnosis.—The tubercular syphiloderm is to be differentiated from lupus vulgaris, carcinoma cutis, rosacea, psoriasis, and leprosy. If the character, course, color and distribution of the nodules, together with their tendency to form thin, atrophic, whitish scars, and the fact that other symptoms of syphilis are usually present, are kept in mind, confusion will seldom arise.

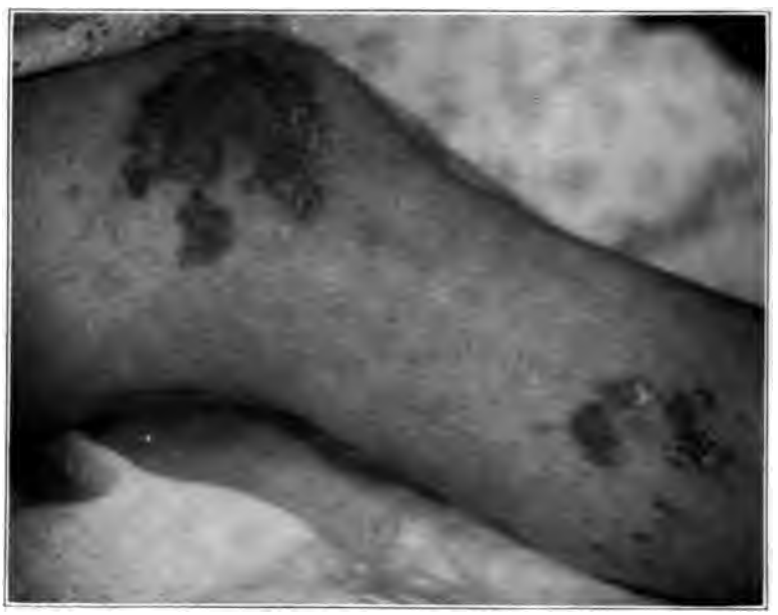

Fig. 655.—Tubercular syphilides of knee and leg.

In lupus vulgaris the nodular, corded appearance of the scars, the limited size and gradual development of the lesions, and the invariable presence of apple-butter-like tubercles should serve for differentiation. Cutaneous carcinomata commonly develop in elderly individuals. The growths are usually single, and their borders are elevated, hard, and indurated. In acne rosacea the lesions are symmetric, non-ulcerative, and confined to the flush areas of the cheeks and nose. Psoriasis involves the extensor surfaces of the elbows and knees in a large percentage of instances, and never gives rise to suppuration, ulceration or scarring. The disease usually begins in childhood. By

scraping off the scales the presence of the typical bleeding points can readily be demonstrated.

Leprosy is a rare disease in the temperate zones. The lesions develop slowly, are yellowish in color, often with some associated pig-

Fig. 656.—Broken-down gumma of wrist.

Fig. 657.—Broken-down gumma of leg.

Fig. 658.—Broken-down gumma of nose

Fig. 659.—Syphilitic, ulceration of scalp and skull. (Courtesy of Dr. John W. Perkins.)

Fig. 660. Gumma of tongue.

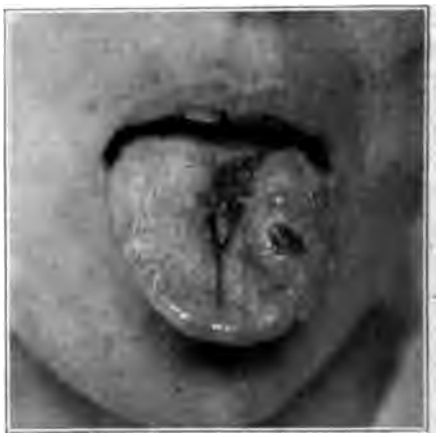

Fig. 661.—Gumma of tongue.

Fig. 662.- Hypertrophy of vulva, and ulceration of perineum due to syphilis. (Courtesy of Dr. Otto Leslie Castle.)

Fig. 663.—Tertiary syphilis in a woman of 42. Eyes, nose and lips have been destroyed. The case is very suggestive of gangosa, but the patient had never been outside the limits of the United States. (Courtesy of Dr. John W. Perkins.)

Fig. 664.—Ulceration in tertiary syphilis. (Courtesy of Dr. John W. Perkins.)

Fig. 665.—Tertiary syphilis of nose

Fig. 666.—Gummata and tubercular syphilitic lesions of arm and trunk. (Courtesy of Drs. A. P. Biddle and R. A. C. Wollenberg.)

mentation. Other symptoms of leprosy, such as anesthesia, may be present. In obscure cases, resort may be had to a biopsy.

Gummatous Syphiloderm.—In the extremely malignant grades of syphilis, gummatous lesions may develop early in the course of the disease, but as a rule they seldom occur before the end of the second year, and they usually appear much later than this. Gummata are single or multiple, firm, rounded or egg-shaped, infiltrated, subcutaneous masses which involve the epidermis secondarily, giving rise to reddish, bluish, or brownish, pea- to walnut-sized or larger, circumscribed, oval tumors, which may undergo absorption, but which often break down to form soft, sharply defined, punched-out ulcers. The earlier lesions develop in the course of several days or weeks, and give rise to little or no pain, unless it is a result of pressure. As the overlying skin becomes involved, it assumes a bluish or purplish hue, usually with an accompanying pinkish or reddish areola. The resultant ulcers are reddish or purplish in color, with soft, flabby or necrotic edges, and red, sometimes greenish, granular floors, bathed in mucus and pus. They may involve only the corium and superimposed epidermis but generally the subcutaneous tissues are attacked, and even the cartilaginous and bony structures may be affected. Subjective symptoms are slight or entirely lacking. Gummata are commonly single, but it is not unusual to find a few or several occurring in one individual, and instances have been reported in which the lesions numbered a hundred or more. The most frequent sites are the thighs, buttocks, the calves of the legs, and the forehead and scalp. No region, however, is exempt. Gummata may develop beneath mucous membranes as well as beneath the skin. Extensive areas of infiltration may develop primarily, but are usually a result of the coalescence of adjacent lesions. The affected part may become enormously swollen, and, in the non-ulcerative cases it may assume a congested, elephantine appearance (as in esthiomène). Should ulceration occur, the ensuing disfigurement is even greater, especially if the face is involved. As in syphilodermata of the tubercular variety, the lesions may assume crescentic and serpiginous shapes, and marginal and satellite lesions are not unusual. The resulting cicatrices are similar to those which develop following ulceration in the tubercular form, although their surface is sometimes rougher, and more conspicuous and unsightly than in lesions of the less extensive type. Gummata generally respond favorably and promptly to treatment.

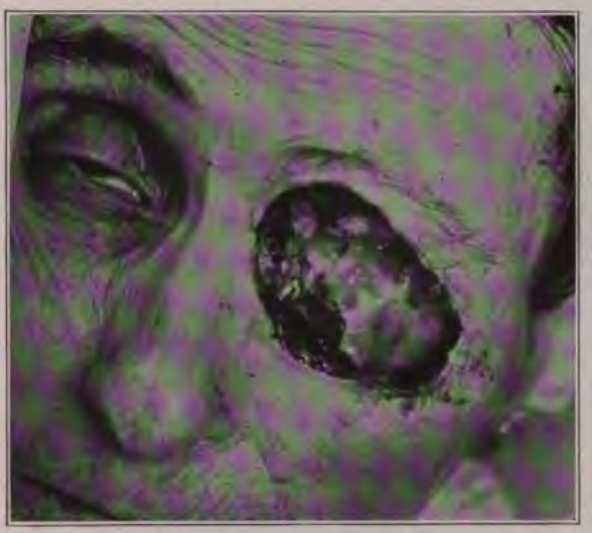

Fig. 667.—Ulcerated gumma of eye. (Courtesy of Dr. Otto Leslie Castle.)

Fig. 668.—Broken-down gumma of buttock.

In the malignant precocious types of the disease, gummata may develop within the course of only a few weeks, instead of months or years.

Diagnosis.—Gummata are to be distinguished from fatty, fibrous, and malignant tumors, from sebaceous cysts, and from enlarged lymphnodes. At the fluctuant and ulcerative stage they might

Fig. 669.—Ulcerated gummata of face and chest. Some of the lesions have healed, giving rise to typical scarring. (Courtesy of Dr. Harold N. Cole.)

be confused with furuncles or carbuncles. All the above growths develop slowly and seldom occur on the lower extremities or on the face. I have twice encountered cases, however, in which gummatous lesions of the scalp had been mistaken for infected sebaceous cysts. In these instances the history is particularly valuable, and all doubtful cases should be subjected to a serum or luetin test. In interpreting the luetin test the fact must always be borne in mind that the presence of iodides and possibly other substances may give rise to a positive reaction (Sherrick; Cole). Carcinomata early exhibit ulcerative changes, and their borders are usually hard, indurated, and nodular. In the disorders due to staphylococcic infection the pain and tenderness are extreme, and the course of the affection far more rapid than in syphilis.

CUTANEOUS MANIFESTATIONS OF HEREDITARY SYPHILIS.

In hereditary syphilis the disorder may be transmitted by one or both parents. It is probable, however, that infection occurs through the mother in the vast majority of instances. The lesions do not materially differ from those seen in the acquired form of the disease, although certain types of the eruption may occur with much greater frequency here than in syphilis acquisita. A large proportion (from 35 to 40 per cent) of syphilitic conceptions terminate in abortion or still-birth. Of the children born alive, 75 per cent or more die before the end of the first year (Hyde). Cutaneous lesions may be present at birth, or may develop at any time during the first four or five months. As a rule, syphilitic babies are marantic, emaciated and feeble, with thin, wrinkled skins, and wizened, senile faces. Coryza, often accompanied by rhinitis, "snuffles," and hoarse breathing, may be among the earliest manifestations. Mucous patches and condylomata are invariably present at some time during the first few months, and these lesions often develop prior to the appearance of the general exanthem. The character of the cutaneous eruption varies. Bullous lesions are much more common in hereditary than in acquired syphilis. The blebs vary in diameter from 1 to 5 cm., and are usually only partially distended, with eroded bases, and flabby, fragile walls. They may contain mucus, or sanious fluid, and, when they rupture, form yellowish or brownish crusts. Lesions of this variety may be generalized, but more frequently are limited to the palms and soles. Often on the general surfaces they are intermixed with

macules, maculopapules, papules and, occasionally, pustules. Lymph-node involvement is often present, but is not a typical or characteristic feature. The most common types of eruption are the papular and maculopapular. Miller found fissures of the lips, angles of the mouth, and anus present in almost three-fourths of his cases. Pustular lesions, like bullae, usually indicate a grave type of the disease, or an extremely low grade of resistance on the part of the patient.

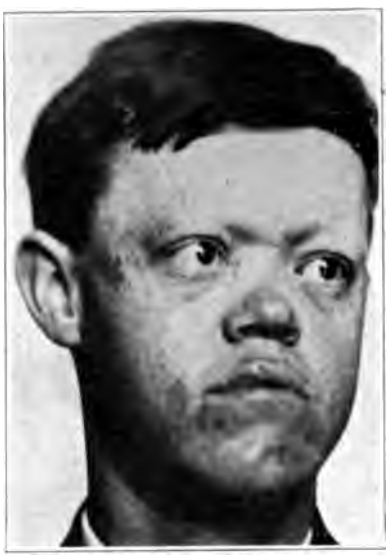

Fig. 670.—Hereditary syphilis, showing characteristic nasal deformity. (Courtesy of Dr. Howard Morrow.)

Tubercular and gummatous lesions seldom occur early in the course of the disease. Of the other later symptoms, notched teeth (Hutchinson's teeth), dactylitis, keratitis, and exostoses are the most common.

Diagnosis.—Recognition is usually easy. The lesions on the mucous surfaces (mucous patches, and condylomata about the mouth and the anus) are the most characteristic. The occurrence of palmar and plantar bullae also is almost pathognomonic. A dry, shriveled condition of the integument covering the general surface should arouse suspicion, and if combined with lesions of the mucous membranes, or with hoarse breathing, coryza or snuffles, should lead to serological investigation. Later manifestations, such as altered teeth, dactylitis,

keratitis, etc., sometimes furnish the leading clew in cases that have previously escaped detection.

Etiology.—Syphilis is due to a specific organism, the Spirocheta (or Treponema) pallida of Schaudinn and Hoffmann, and may be acquired by direct or indirect inoculation, or through heredity. In

Fig. 671.—Hutchinson's teeth. (Courtesy of Drs. Fordyce and MacKee.)

Fig. 672.—Hutchinson's teeth. The patient was a woman, and the mother of three apparently healthy children. (Courtesy of Dr. C. Morton Smith.)

Fig. 673.—Hutchinson's teeth. There was also present an interstitial keratitis. (Courtesy of Dr. C. Morton Smith.)

the majority of instances infection occurs as a result of direct inoculation, generally during coitus. Extragenital infection is not uncommon, and occasionally, as in the remarkable series of cases reported by Schamberg, one infected person may unknowingly, or carelessly, infect several or more innocent individuals. Syphilis in the innocent is known as "syphilis insontium." Moist lesions of all kinds

in the earlier active stages of syphilis are especially dangerous, a fact which should be made known to every syphilitic at the earliest possible moment. Inoculation may occur directly, as in coitus, kissing, biting; or indirectly, through the medium of razors, drinking cups, eating utensils, dental instruments and tattooing needles. It is improbable that infection ever occurs through an unbroken skin,

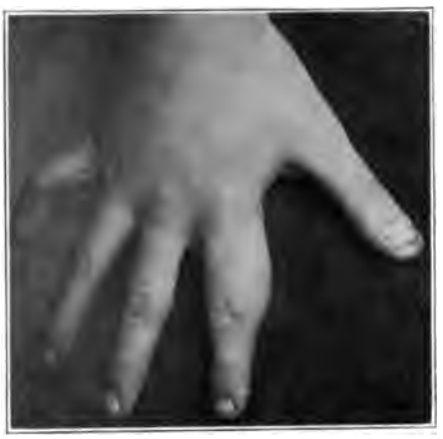

Fig. 674.—Syphilitic dactylitis in a little boy.

Fig. 675.—Syphilitic dactylitis. (Courtesy of Dr. H. C. Baum.)

but the break or abrasion of the integument may be so minute as to be indistinguishable to the naked eye. The virulence of the organisms is greatest in the primary and the earlier part of the secondary stages of the disease. They occur in the lymph and blood, and probably in the physiological secretions. From this time onward the infectiousness gradually diminishes until, at the end of four or five years, there is, as a rule, but little danger of direct transmission. In-

stances of inoculation from gummata have been noted, however, and too much stress should not be placed on the innocuousness of the lesions in this stage of the disease. The spirocheta pallida is a delicate, cylindrical, spiral-shaped, motile organism which varies from 5 to 20 microns in length. The number of spirals varies from 6 to 15. The organism is pathogenic to rabbits and anthropoid apes as well as to man, and its presence in the lymphatic fluid of the infected lesion can usually be readily demonstrated by means of dark field illumination, or by the India ink method. The organism at first penetrates and

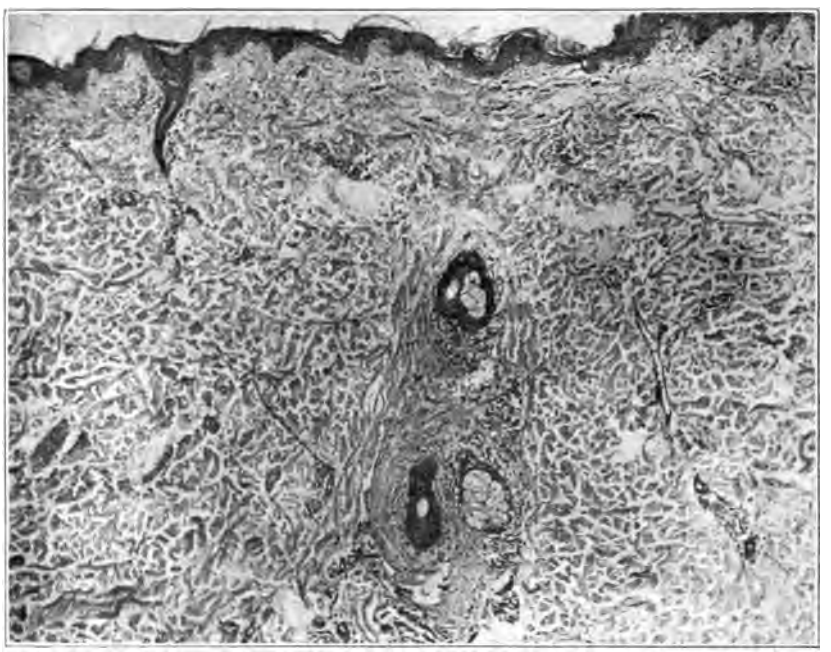

Fig. 676.—Section of macular syphiloderm. (Courtesy of Dr. C. C. Dennie.)

multiplies in the mucous layer of the epidermis and in the lymph spaces of the corium, but it is very probable, as Pusey has suggested, that in the end "the general diffusion of the spirochetes over the body is largely by means of the blood stream."

Pathology.—In lesions of the macular variety the principal changes are those occurring as a result of widespread and extensive round-cell infiltration, particularly in the perivascular regions. The walls of the capillaries are thickened, and as a result of the dermal edema the papillae may be flattened, or even obliterated.

In the follicular syphilide, Dennie found "an almost normal hair follicle in the central portion of the lesion. A few small lymphocytes and an occasional plasma cell were situated about this structure, likewise a similar mild change just under the epithelium. The enveloping sheath of the hair showed the most noticeable changes. The basal cells were enlarged, vacuolated and spread apart; so that the intervening spaces seemed to communicate with the neighboring tissues beyond, and with similar spaces between the prickle cells above. Lying in these spaces were numerous spirochetae pallidae, together

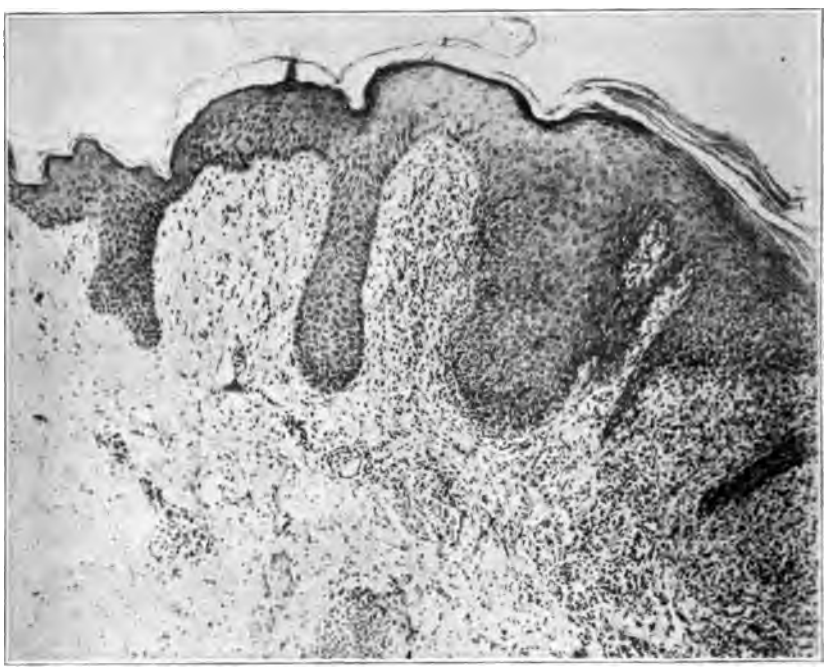

Fig. 677.—Section of an annular secondary syphiloderm, showing histologic changes. Numerous spirochetes are to be found only in the vicinity of the mucous layer. (Courtesy of Dr. C. C. Dennie.)

with polymorphonuclear leucocytes; the former were found in no other part of this pathological structure."

In the large papules the blood vessels are dilated, and their walls are greatly thickened, and there is widespread cellular infiltration (plasma cells and lymphocytes) throughout the corium. The prickle layer is increased in depth (acanthosis), edematous, and occasionally infiltrated with lymphocytes and polynuclear leucocytes.

In a typical example of vesicular syphilide, Dennie found the le-

sion to be built around a hair follicle, and to consist of "a dense infiltration of small lymphocytes and plasma cells in a large triangular mass, with the apex beginning at the hair shaft, a short distance below its origin from the skin, and its base below the fat glands. The corium was pushed out in all directions, leaving the lesion sharply defined. This infiltrated area contained numerous spaces in which were probably lymphatic, but practically no blood vessels. Near the hair shaft were some connective tissue fibers which were probably of

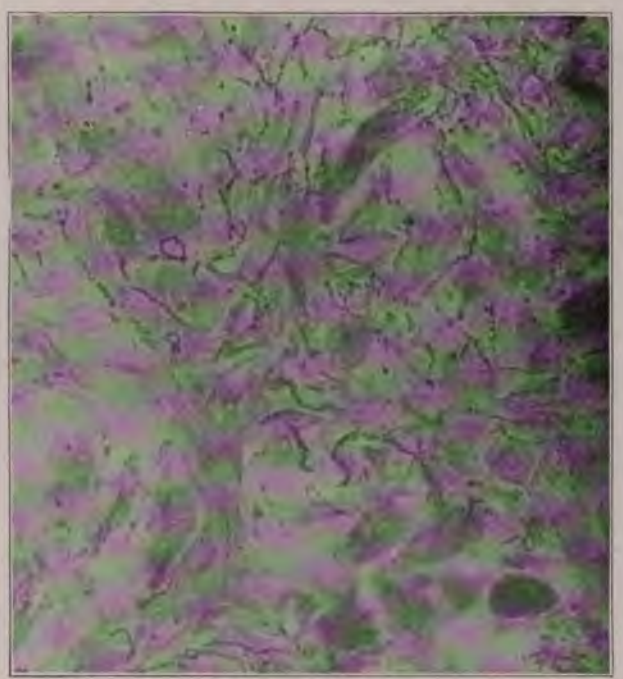

Fig. 678.—Section of chancre, showing S. pallidae. (Courtesy of Dr. L. S. Schmitt.)

recent origin. The epithelial cells of the hair follicle showed some changes—the cells of the basal layer were shoved apart, and in the spaces between was a moderate number of small lymphocytes. The follicle had a narrow halo surrounding it which was due to edema; beyond this and outside the infiltration, the blood vessel showed both periarteritis and endarteritis with a collar of small lymphocytes; no giant cells were present, and the overlying epithelium showed but little change.

"A similar lesion impregnated by Levaditi's method showed no

spirochetae pallidae in any part; but, strange to say, a neighboring hair follicle, showing no marked pathological change, did show numerous spirochetae pallidae in the space between the epithelial cells of the hair-enveloping sheath."

In a condyloma of six weeks' duration, Dennie found "the papillary projections of the corium, which dovetailed with corresponding epithelial papillae, were histologically divisible into two parts. First, the upper two-thirds, which was characterized by numerous parallel capillaries, the greater number filled with red blood cells, but here

Fig. 679.—Section from a so-called latent syphilitic nodule due to luetin reaction. Note giant cells. (Courtesy of Dr. C. C. Dennie.)

and there one filled with leucocytes. Here the infiltration consisted of small lymphocytes and plasma cells, except in the top of the papillae, where there were also many leucocytes, but where the infiltration was not very heavy. Numerous lymph spaces also occurred, but these could be differentiated from blood vessels by their thinner walls and the fact that they contained no blood elements. A rather frail connective tissue was present between the vessels.

"The lower part of the papillary region of the corium was quite different, for here there was a more dense infiltration with a larger

number of plasma cells. This band was situated about the tip, and for a short distance up the epithelial papillae; below this area the capillaries were increased, but the larger blood vessels did not show much increase, nor did their walls show marked changes, although they had a collar of small lymphocytes. The coil glands showed no changes, except a slight periglandular, small lymphocyte infiltration.

Fig. 680.—Longitudinal section in a case of alopecia syphilitica. (Courtesy of Dr. C. C. Dennie.)

"The arrangement of the spirochetae pallidae in this lesion was most remarkable. Not one was found among the dense lymphocyte and plasma cell infiltration; in fact, they were not found in any part of the corium at all, excepting in the very tips of the intrapapillary masses, where they communicated with the epithelium through the ragged basal cell layer. Here they were numerous, and many could

be seen, with half the body in the intrapapillary mass, and the other half between the epithelial cells. As they extended up in these spaces, they became more and more numerous, until, together with the leucocytes, they formed a lacework mass around the epithelial cells, where hundreds were present in one field. The organisms were not universally present between the prickle cell layers, but

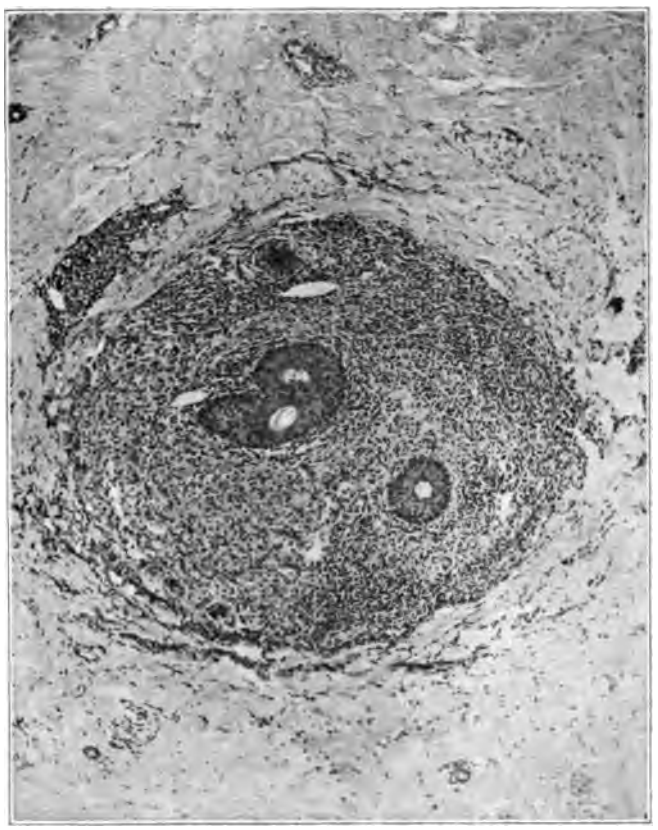

Fig. 681. Cross-section of a hair follicle from a case of alopecia syphilitica. (Courtesy of Dr. C. C. Dennie.)

occurred in colonies near the papillary cones. They could be found in other epithelial areas, but only in sparse numbers.

"In the tip of the papillary cones, they were not arranged in any particular manner. It would seem that they gained access from the tip of these structures through the interrupted basal layer to the prickle cells, and multiplied there; apparently their growth was not

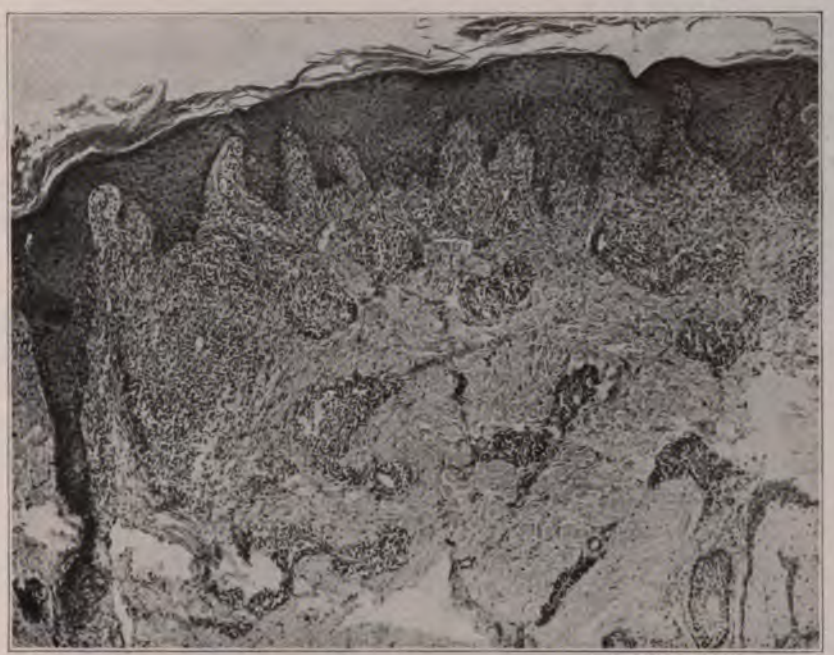

Fig. 682.—Flat papular syphiloderm. The interstices surrounding the basal layer contain numerous spirochetes. (Courtesy of Dr. C. C. Dennie.)

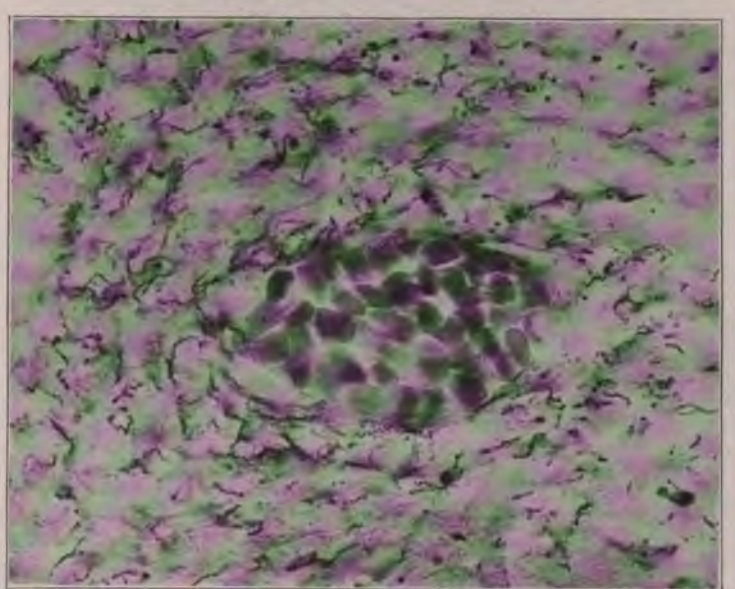

Fig. 683.—Section from an early chancre, showing S. pallidae in and about the walls of a blood vessel. Characteristic absence of small lymphocytes in early involvement of tissue. Very high magnification. (Courtesy of Dr. C. C. Dennie.)

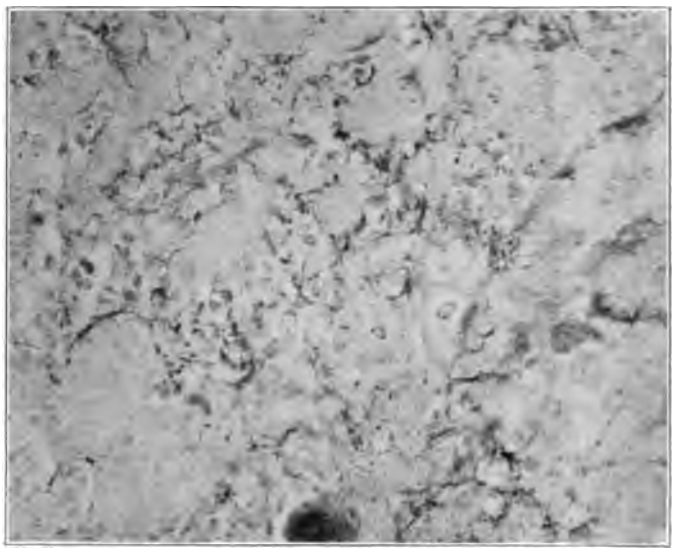

Fig. 684.—Section of a vegetating condyloma, showing parasites and leucocytes around the skin cells. (Courtesy of Dr. C. C. Dennie.)

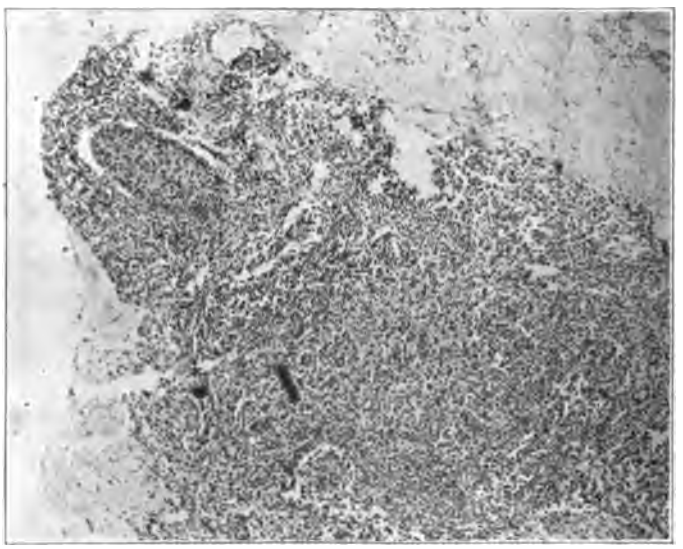

Fig. 685.—Cellular infiltrate in vesicular syphilide. Low magnification. (Courtesy of Dr. C. C. Dennie.)

inhibited by the presence of leucocytes; on the other hand, small lymphocytes and plasma cells seemed to be inimical to their growth, since the treponemata were not found where there was any marked infiltration of these elements. This observation is in accordance with the findings of Dr. J. Homer Wright. The location of the spirochetae pallidae probably accounts for the tremendous infective nature of the granuloma, as the organisms can, by their mobility, migrate by way of the intracellular spaces to the outside. They also probably migrate from between the epithelial cells into the deeper tissue by the same route as they do in the chancre."

In a nodular (tubercular) syphilide, Fordyce found the entire cutis from the epidermis to the subcutaneous fat, involved. The

Fig. 686.—Gumma of submaxillary region.

vessels were increased in number, and showed the effects of an obliterative endarteritis. The corium was densely infiltrated with plasma and giant cells, lymphocytes and hyperplastic fibroblasts. A number of the lymph spaces were thrombosed. Of the connective tissue bundles that remained intact, many exhibited vacuolation (probably a result of fatty degeneration and beginning regression). The epidermis was thinned, and its under surface almost perfectly flat.

Gummata.—Gummata consist of dense collections of plasma cells, lymphocytes and leucocytes in a partially disintegrated framework of connective tissue. The accompanying vessels exhibit changes which are characteristic of luetic arteritis, such as thickening and endar-

teritis obliterans. As a result of interference with nutrition, caseation may occur, or, more frequently, the gummatous mass undergoes necrosis, the thinned and weakened overlying epidermis sloughs away, and a typical ulcer is formed. On the other hand, Nature may overcome the disease process, and absorption, with some slight resultant scarring, may supervene. Warthin has recently shown, how-

Fig. 687.—Section from a gumma, showing giant cell in a blood vessel. High magnification. (Courtesy of Dr. C. C. Dennie.)

ever, that spirochetae can be found in tissues of clinically inactive or cured syphilis.

Diagnosis.—Too much emphasis cannot be placed upon the necessity of a careful consideration of the entire symptom-complex in every case of suspected syphilis. An expert may at times be able to arrive at a definite and correct conclusion from the examination of a single clinical manifestation, but the medical man of average

training cannot be too careful or thorough in sifting the evidence presented in a doubtful or puzzling case of the disease. In recent years we have grown to depend largely upon the laboratory for diagnostic aid, in fact too much dependence is often placed on this source. As has been repeatedly demonstrated, a single positive or negative serum reaction, in the absence of corroborative clinical evidence, may mean nothing. For this reason, if no other, a careful case history which includes all ascertainable facts, together with a thorough general physical examination of the patient, should in-

Fig. 688.—Section of a small scaling papular syphiloderm. Moderate magnification. (Courtesy of Dr. C. C. Dennie.)

variably be made. In the earlier stages of the malady the causative organism can usually be recovered from the lesions (care being taken to avoid confusion with non-luetic treponemata). Following this, the definite evolution of the disease, the occurrence of lesions on the mucous membranes, the general involvement of the lymphatic nodes, and the development of condylomata, should attract attention. During the so-called tertiary period, the lesions are generally so characteristic as to be readily recognizable. In a large percentage of instances the history is negative or valueless. The occurrence of

repeated miscarriages without apparent cause is always strongly suggestive of tertiary lues in women. Noguchi's luetin test is particularly valuable in the later stages of the disorder, although, as previously stated, the presence of iodides and possibly other salts in the tissues may give rise to a reaction which will mislead even an experienced observer.

Prognosis.—The prognosis in syphilis should always be guarded. As a rule, the earlier treatment is instituted, and the more thoroughly it is carried out, the better the outlook. Unfortunately, in a

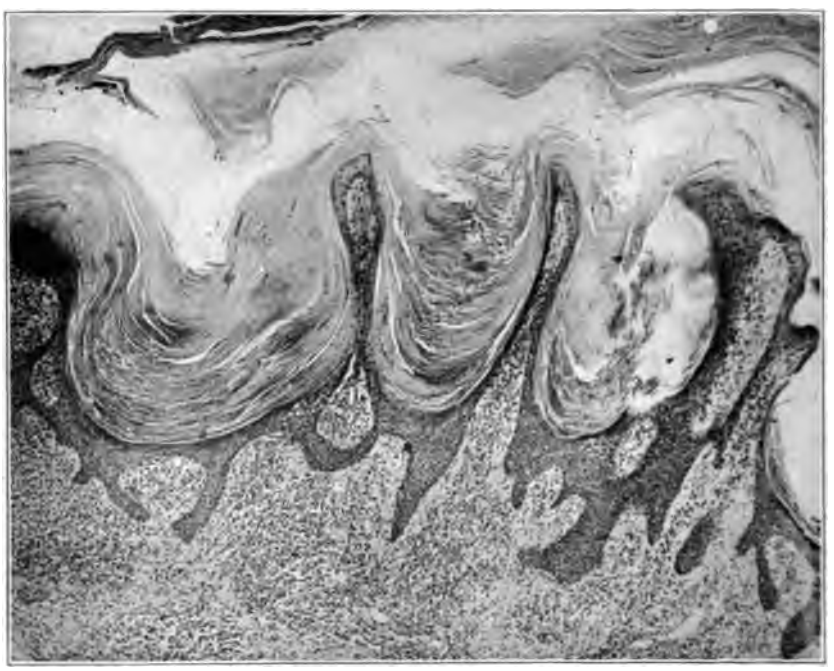

Fig. 689.—Rupial syphilide. Moderate magnification. (Courtesy of Dr. C. C. Dennie.)

small percentage of the cases, however, the after-consequences are disastrous no matter how vigorous the treatment.

Alcoholism, tobacco, and mental, physical and sexual excesses all are distinctly detrimental to the welfare of the patient. Formerly it was believed that extragenital chancres were followed by syphilis of greater than usual severity, but it is improbable that the location of the initial lesion exercises much influence upon the after-course of the disease. In men whose syphilis is thoroughly treated and who lead temperate lives, the development of tabes and paresis is rare, probably considerably less than 1 per cent (Pusey). Aside from these two

conditions, however, the disease may materially lessen the average life expectancy of the affected individual. The statistics of *The Association of Life Insurance Medical Directors* and the *Actuarial Society of America* indicate that syphilitics show an excess mortality of about 70 per cent (Pusey).

Treatment.—Few diseases respond more readily to treatment than lues, and few diseases are more often wrongly or insufficiently treated. One of the most important steps in the treatment of a case of syphilis is the education of the patient. Daily cleansing of the

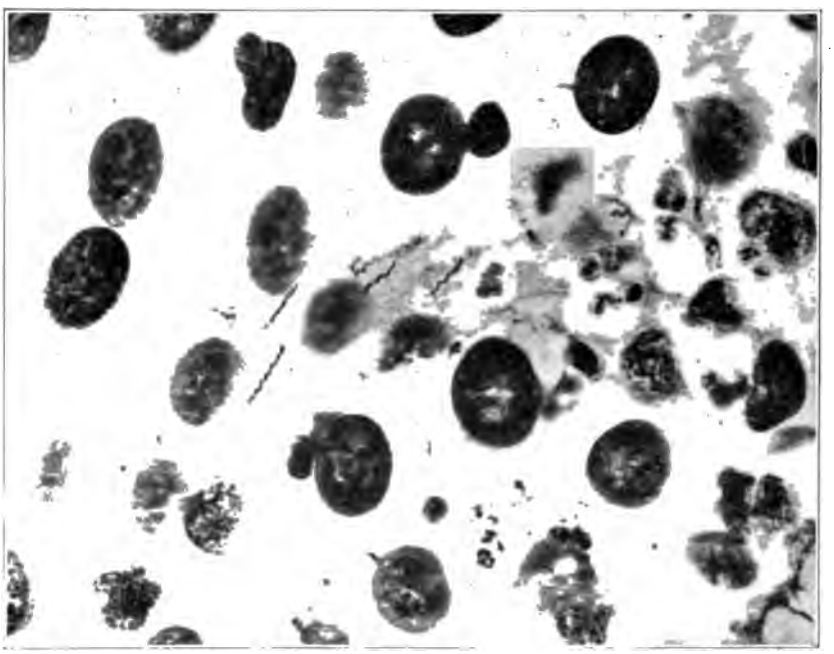

Fig. 690.—Section from the wall of a hair follicle in secondary syphilis, showing numerous parasites. (Courtesy of Dr. C. C. Dennie.)

teeth and gums, proper regulation of the bowels, frequent or occasional hot baths, abstinence from tobacco and alcohol, care in the promiscuous use of drinking cups and other tableware,—all of these are essential to the comfort and welfare of the infected individual and the safety of his associates. The patient's general health should always be carefully observed, and his physical resistance maintained at the highest possible point. Careful search should always be made for focal infections (tonsillar, apical, appendiceal, or prostatic), and if discovered, these should be eradicated at the earliest possible moment. The improvement which usually follows the removal of such a focus in a

resistant case of lues is almost magical. It is, of course, simply a result of the improvement of the patient's general condition; but when methodically followed out, the employment of such a procedure frequently will materially aid in bringing about a cure in an apparently hopeless case. In the constitutional treatment of syphilis the three drugs upon which the greatest dependence has been placed are mercury, arsenic, and iodine. The character of the preparations which are commonly employed is best illustrated diagrammatically:

- **Mercury**
  - By mouth
    - Mercurous iodide.
    - Mercuric iodide.
    - Mercuric chloride.
    - Mercurous chloride.
    - Mercurous tannate.
    - Gray powder (mercury with chalk).
    - Blue mass.
  - Inunction
    - Mercurial ointment, alone or diluted with lanolin, lard, or olive oil.
    - Oleate of mercury.
  - Inhalation (By aid of mask).
  - Fumigation
  - Injection
    - Soluble (in water or in oil).
      - Mercuric chloride.
      - Mercuric iodide.
      - Mercuric succinamide.
      - Mercuric benzoate.
    - Insoluble (in oil or in lanolin).
      - Metallic mercury.
      - Mercurous salicylate.
      - Mercurous chloride.
- **Arsenic** (usually by injection)
  - Liquor potassii arsenitis.
  - Atoxyl.
  - Arsacetin.
  - Sodium cacodylate.
  - Soamin.
  - Arsphenamine
    - In alkaline solution.
    - In acid solution.
    - In oil.
  - Neoarsphenamine.
  - Salvarsan natrium.
  - Arsenobenzol.
- **Iodine** (usually by mouth)
  - Sodium iodide.
  - Potassium iodide.
  - Calcium iodide.
  - Ammonium iodide.
  - Ferrous iodide.

MERCURY.—The simplest method of administering mercury is by ingestion, and although less popular now than in former years, this route is still much in vogue. The preparation commonly employed is the protiodide pill or tablet, 1/6 of a grain (0.01), after each meal, gradually increased to ½ of a grain (0.033), or even one grain (0.066), until the physiologic effect (as evidenced by slight tenderness of the gums, gastric disturbance, and frequent bowel movements) is secured. The amount should then be decreased until these symptoms subside, and the drug then continued in the smaller dosage. Mercuric iodide, in doses of from 1/64 of a grain (0.001) to 1/10 of a grain (0.006), after each meal, is also occasionally employed; but this salt, while fairly effective, is usually not so well borne as the milder iodide. Mercury with chalk (hydrargyrum cum creta) is probably the most efficient of all the mercurials that are administered by the mouth, and as a rule gives rise to very little irritation of the alimentary tract. The amount to be given varies from 1 to 4 grains (0.065 to 0.26), after each meal. The bichloride, in doses of from 1/24 to 1/2 of a grain (0.0027 to 0.037), in pill form, or dissolved in a small amount of water, and followed by copious amounts of the liquid, often acts admirably. Hunt strongly recommends this salt in the treatment of syphilis in infants. Pusey speaks highly of the tannate, and Morris prefers the blue pill. Should any of the mercurials give rise to severe griping, or to diarrhea, before the antisyphilitic effect is secured, small amounts of opium, in the form of paregoric, or of Dover's powder, may be concurrently administered. At one time it was thought that this drug also exerted a beneficial action on the course of the disease, but it is doubtful if this is true.

Inunction.—The popularity of the inunction method of administering mercury is largely due to the excellent results attained by its use in Vienna, since about the middle of the last century. Although uncleanly and troublesome, the method is an extremely valuable one, the results being far superior to those following the use of mercury by the mouth. Mercurial ointment (in amounts of ½ to 1 dram—2.0 to 4.0) alone or mixed with an equal quantity of lanolin, lard or olive oil, is the favorite preparation. The drug should be freshly prepared and is to be applied once daily. The glabrous surfaces of the body (the sides of the trunk, the anterolateral surfaces of the abdomen, and the inner surfaces of the arms and thighs) are the most satisfactory sites, and the drug is rubbed and massaged into each of these regions in

turn. In this way each area is employed only once in eight days, and if care is used in the application of the remedy, irritation is not likely to ensue. If the services of a nurse or a professional "rubber" are available, the remedy may be applied to the scapular regions, also. The oleate, in strengths of from 10 to 20 per cent, is less valuable than the blue ointment. The patient should have a warm bath and a thorough scrubbing at least once weekly. This may be followed by the liberal application of a bland powder, such as Anderson's antipruritic powder. Inunctions are best given in courses, a series of daily treatments extending over a period of from a fortnight to a month, being alternated with similar periods of rest, during which time tonics (especially iron), or some form of antisyphilitic remedy other than mercury may be administered. It is impossible to lay down hard and fast rules as to the amount of mercurial ointment to be used, or the frequency with which it should be employed. These factors must be adjusted to meet the exigencies of each individual case.

In an exhaustive series of experiments, Wile and Elliott have recently demonstrated that when mercurial ointment is simply smeared on the bare skin it is absorbed with practically the same rapidity as when rubbed and massaged in for an hour or more. These investigators believe that the drug is vaporized by the heat of the body, and that it is the vapor which is absorbed that gives rise to the symptoms of mercurialization. Schamberg, Kolmer, Raiziss, and Gavran have suggested an ointment consisting of calomel (3 parts), lanolin (1 part), and benzoinated lard (2 parts), 6.0 gm. to be rubbed on nightly. Following an exhaustive series of clinical tests, Cole found the calomel preparations greatly inferior to the simple mercurial ointment.

Instead of applying the ointment to the abdomen, thighs, and other glabrous areas, fully as good results can be secured by smearing it over the soles of the feet once daily, and having the patient sleep with his socks on.

Inhalation.—By the aid of an ingenious mask-like apparatus, which is placed over the face at night, mercury may be administered by absorption from the inhaled air. This method has not met with general approval, however, and is seldom employed in this country.

Fumigation.—Mercurial vapor baths supply a favorable method of employing the drug in some instances. The patient is stripped, and placed on a chair beneath which is arranged a special vaporizing lamp, containing mercury in the form of calomel, metallic mercury or cinnabar, 1 to 2 drams (4.0 to 8.0), and a small amount of water. The lamp is then lighted, and an impermeable cape, which encircles

the patient's neck and extends downward to the floor, is applied. The treatments are administered three or four times a week, and each is of twenty or thirty minutes' duration. They are best given in the evening, in order that the patient may go directly to bed without cleaning his skin after leaving the bath.

Injection.—The introduction of mercury into the body by means of subcutaneous and intramuscular injections supplies a convenient and efficient method of treatment which is gradually attaining the popularity which it so richly deserves. Either soluble or insoluble preparations may be employed. The injections are commonly made in the gluteal region, although the trapezius, in the subscapular region, is occasionally selected. Many authorities prefer the Pravaz syringe. I have found a 1.5 c.c., all glass, Luer model very satisfactory. The needles should be of ample caliber, particularly if the insoluble preparations are used, and at least 4 cm. long. Platinum needles should be employed when the soluble preparations are used, but for injecting the insoluble mercurials steel needles will be found to fulfill every requirement. In the gluteal region the injections are made at a point near the middle of a line connecting the anterior superior spinous process and the base of the coccyx. Both syringe and needle should be surgically clean. An excellent plan is to have a dozen or more bright, sharp needles on hand at all times, and, if a considerable number of treatments are given each day, these can be sterilized, by boiling in water or in oil, early in the morning, and removed from the sterilizer as they are needed. Great care must always be exercised to avoid injecting the remedial agent into a blood vessel. In order to guard against this danger, Joseph and other authorities advise that the syringe be detached for a moment after the needle has been inserted. If the needle opening communicates with a vessel the escaping blood will apprise the operator of the fact. A far better plan, which was first suggested to me by my friend, Dr. W. W. Duke, is to withdraw the piston a sufficient distance to empty the needle, insert the needle, and then withdraw the piston a few millimeters further. If a vessel has been penetrated blood will appear in the syringe barrel. It will then be necessary, of course, to seek a new site for the insertion of the needle. Soluble salts are fairly efficient, but in order to secure the maximum degree of benefit from their use large doses must be given, and at frequent intervals. The bichloride, in doses of from 1/12 to ½ of a grain (0.005 to 0.032), the succinamide, in doses of ⅛ to ¼ of a grain (0.008 to

0.016), or the biniodide or benzoate, from 1/24 to 1/12 of a grain (0.0025 to 0.005), may be administered once daily, or on alternate days.

Lewin, who is a pioneer in the injection treatment of syphilis, employs the following formula:

℞ Hydrargyri chloridi corrosivi.....gr. xxiv (1.5)
Sodii chloridi .....gr. xvi (1.0)
Aquae destillatae .....f℥ iiiss (105.0)
Misce et signa: Fifteen drops injected once daily. The amount to be gradually increased.

I have found the following formula a very satisfactory one, and the injections are comparatively painless:

℞ Phenolis,
Hydrargyri chloridi corrosivi,
Sodii chloridi .....āā gr. viiss (0.5)
Aquae destillatae .....f℥ i (30.0)
Misce. Shake and inject ten drops once daily, gradually increasing the amount until the physiological effect is produced.

The succinamide may be successfully employed in a similar mixture. Two of my friends, Drs. Will and Frank Iuen, who have had wide experience in the treatment of syphilis, prefer this salt of mercury to all others. They employ it in aqueous solution, and inject ¼ of a grain (0.016) once daily. In dealing with all of the soluble preparations care must be taken to prevent their coming in contact with metals, other than platinum. In this way not only deterioration of the chemical, but also subsequent suffering on the part of the patient will be avoided. The employment of mercury intravenously I mention only to condemn. Personally I consider mercurial medication by this route both inefficient and unsafe.

Of the various insoluble preparations, the salicylate, calomel, and gray oil are the ones most extensively used. When the parent element is employed, the average dose is 2/3 of a grain (0.04), the metal, being suspended (after fine subdivision) in lanolin, albolene, or palmatine. Creosote or camphor can be added in order to lessen the pain. Lambkin's "cream" consists of purified mercury (10 per cent), in palmatine. The dose is from 8 to 15 minims. The mixture must be warmed before using. Mercuric salicylate is a reliable and efficient drug, and is extensively employed at the present time. From a serologic viewpoint it is a valuable and dependable preparation. The initial dose is one grain (0.064), and the injections are made at

bi-weekly intervals. The salt may be suspended in a vegetable oil, in mucilage of acacia, or in one of the mineral oils. The last named media (of which albolene is an example) are very slowly absorbed and are occasionally followed by the development of paraffinoma-like masses (as Hazen and others have shown). Consequently they are far inferior to the vegetable products. I have found the following formula, which was first suggested to me by Dr. Sigmund Pollitzer, an eminently satisfactory one:

℞ Hydrargyri salicylatis,
Anæsthesini .....āā 3 ss (2.0)
Adipis lanae .....3 i (4.0)
Olei olivae .....f℥ i (30.0)
Misce et signa: Shake and inject 15 drops in gluteal muscles twice weekly.

In some instances it is advisable, as Dr. Pollitzer has suggested, that the amount of salicylate in this mixture be doubled, and be given at longer intervals. This plan is an excellent one, but the dose should be increased very gradually, in order to avoid the danger of salivation. If, after a thorough trial of one mercurial, the serologic results are not what they should be, it is wise to adopt another formula, or employ inunctions for a time. It is very probable that certain strains of the spirocheta are unaffected, or but slightly affected, by certain salts of mercury.

An excellent preparation of mercury, for the formula of which I am indebted to Dr. A. J. Markley of Denver, consists of equal parts of double distilled mercury (such as is used by dentists) and anhydrous wool fat, with 10 per cent of olive oil added. One minim of this combination is injected intramuscularly, once weekly, by means of a Gottheil syringe or a tuberculin syringe. The narrow barrelled syringes can be more readily loaded if the mercurial mixture is first placed in an ordinary urethral syringe, from which it can be easily squirted into the barrel of the smaller instrument.

Arsenic.—Various arsenical preparations, sodium cacodylate, arsacetin, atoxyl, hectine, and soamin, have at different times enjoyed more or less transient popularity as antisyphilitic remedies, but it remained for Ehrlich and his co-laborers, Hata, Bertheim, Uhlenhuth, Thomas, and others, to place the employment of this agent upon a scientific basis. Ehrlich, who had had wide experience in biochemistry, set out to discover a compound which possessed a close chemical affinity for the spirocheta pallida, and which would exert a destruct-

ive (parasitropic) action on this organism, and which, at the same time, did not possess an affinity for human tissues (organotropic). Arsenic was the basic remedy finally selected, and the experimental work was carried out on animals and fowls which had been infected with certain spirilli and trypanosomes biologically closely related to the spirocheta pallida. Later, the perfected remedies were employed in the treatment of syphilitic rabbits, and, after long and careful testing with respect to their possible toxicity, they were administered to human beings. Salvarsan, or better arsphenamine, popularly referred to as "606," owing to the fact that it was the six hundred and sixth preparation in the long series of constructive experimental compounds, is dioxydiamido-arseno-benzene-dihydro-chloride, and is a yellow powder, soluble in water, and has a strongly acid reaction. It contains 31 per cent of arsenic. Ehrlich believed that with the perfection of this synthetic compound he had produced an agent which was practically devoid of organotropic properties, and at the same time was so highly parasitropic that a single dose would prove curative. While the remedy fell far short of fulfilling Ehrlich's ideal, later experience has proved that it is by far the most efficient single weapon against syphilis that has yet been discovered. The average dose for an adult is 9 grains (0.6), and the drug is generally administered intramuscularly, subcutaneously or intravenously. When ingested, or employed per rectum, its therapeutic effect is almost nil. The agent is marketed in ampules, and each container, before being broken, should be carefully inspected for possible defects. Exposure to the atmosphere for any considerable length of time may result in oxidation and deterioration, with the formation of toxic substances. Since 1914, a number of American, English, and French preparations of arsphenamine have been placed on the market. Arsenobenzol is probably the most popular in this country, although diarsenol and arsenobenzol-Billon have many advocates.

Intramuscular Method.—This method, which is by far the most efficient, if one is to judge by the serologic results (Craig), is far less popular than it should be, largely owing to the fact that it is extremely painful unless properly carried out. The original Alt-Lesser technic called for the use of a large amount of fluid (at least 20 c.c.), in which to dissolve the drug, and the neutralization process, accomplished by means of a strong solution of sodium hydrate (15 per cent), was frequently carried far beyond the necessary point. In consequence, large, indurated masses, and even abscesses, frequently

developed following the injections. The best method of preparing the agent for administration is a modification of this technic. All instruments and utensils, and the 4 per cent sodium hydrate solution are sterilized by heat. In passing, it may be stated that the physician who habitually depends upon his druggist, or upon anyone else who has had no training in surgical asepsis, for the sterilization of instruments and the preparation of the material to be injected, is guilty of malpractice. The arsphenamine is dissolved in 6 c.c. of sterile water by the aid of rough-surfaced glass beads. Four drops of a 1 per cent alcoholic solution of phenolphthalein are placed in the mixture to serve as an indicator, and the sodium hydrate solution is then added, drop by drop, with a small pipette, meantime vigorously shaking the mixture, until the resulting emulsion is slightly but permanently pink in color. The mixture is then drawn into a 10 c.c. all-glass syringe, and the injections immediately made into either the lumbar muscles, or, better, into the gluteal muscles.

Care must be taken to place the dose properly in the middle of the muscle mass. There is commonly some lumbago-like pain for a few days, but if the dose is properly prepared and injected this is seldom great enough to incapacitate the patient for ordinary labor. The main points to be considered in preparing the drug for injection are slight alkalinity (for this reason a 4 per cent NaOH solution is preferable to the 15 per cent generally recommended), minimum bulk, and absolute cleanliness. The solution is injected in the gluteal or the lumbar region, the dose being equally divided between the two sides. Recently, Harrison, White, and Mills of the British Army have reported very gratifying results following intramuscular and subcutaneous injections of neoarsphenamine.

Subcutaneous Method.—This route is far inferior to the intramuscular owing to the fact that the absorption area is greatly decreased, and the solution, unless carefully placed, is liable to give rise to indurated masses which disappear very slowly.

Intravenous Method.—Despite the fact that the intravenous injections are the least effective of all, this route is a popular one, possibly because of the very slight pain and inconvenience experienced by the patient. As when employing the intramuscular method, all apparatus and solutions should be sterilized. Experience has shown that only freshly distilled water should be employed. The gravity infusion method is far safer than injections by means of a syringe.

The arsphenamine is dissolved in 50 c.c. of sterile water, and from

18 to 20 drops of a 15 per cent aqueous solution of sodium hydrate is then added, the amount being just sufficient to make a perfect solution. Enough 0.5 percent. saline solution is then added to bring the total amount up to 200 or 250 c.c. The injection is made into the median, basilic, or other prominent vein, the patient in the meantime being in the recumbent posture. The needle should not be too large, and it is seldom necessary to incise the skin overlying the vein. Ballinger recommends the preliminary use of a stiletto-like instrument (shaped something like a small ice-pick) in order to facilitate the introduction of the needle through the skin.

Neoarsphenamine ("914") and sodium salvarsan ("1206") each contain 20 per cent of arsenic, and both are more readily soluble in water than salvarsan. These preparations may be employed intramuscularly, subcutaneously, or intravenously, in aqueous solution, without the previous addition of an alkali. Wechselmann reports excellent results following subcutaneous injections of neoarsphenamine, and Loeb believes that sodium salvarsan (salvarsan natrium) administered intramuscularly, is as easy to employ as neoarsphenamine and as efficient as arsphenamine.

Herxheimer's reaction is a peculiar phenomenon, characterized by a temporary aggravation of the symptoms of the disease, which sometimes occurs shortly following the administration of salvarsan. It is commoner in the earlier stages of the secondary period, and is supposed to be due to the absorption of the toxins liberated by the dying spirochetes. Stokes advises atropin as a protection against acute arsphenamine reactions.

IODINE.—The iodides have long held a deservedly high place in the treatment of syphilis, but the fact should always be borne in mind that these preparations have no specific action on the causative organism. In the late stages of the disease they undoubtedly hasten the absorption of the exudates, and aid in the healing of gummatous lesions, and also probably open up new avenues of attack for the treponemicidal drugs (arsenic and mercury). The potassium and the sodium salts are those commonly employed, and the dosage varies according to the indications which are to be met. Hartzell has found comparatively small doses, from 5 to 15 grains (0.3 to 1.0), fully as efficient as large ones, and my experience coincides with his. The drug should be taken after meals, in plentiful amounts of water, or in an ounce or two of water, followed by a glassful of sweet milk. Occasionally it is necessary to resort to large doses of the iodides (as in the so-called nervous types of syphilis). In these cases a saturated

aqueous solution may be prescribed, and the patient advised to take ten drops, in water, after each meal, increasing one drop per dose until the symptoms of iodism, such as coryza and faucial irritation supervene, when the amount should be decreased.

In those instances in which the injection or inunction methods of administering mercury are impracticable, a combination of mercury and iodides can often be advantageously prescribed, particularly in the later stages of the disease. The venerable "8-8-8" mixture is a representative one of this type.

℞ Hydrargyri chloridi corrosivi.....gr. viii (0.5)
Potassii iodidi .....ʒ i (30.0)
Syrupi sarsaparillae compositi...q. s. ad fʒ viii (240.0)
Misce et signa: A teaspoonful in a half-ounce of water, followed by a tumblerful of water, after each meal.

External Treatment.—In no disease is cleanliness and the exercise of modern hygienic measures more important than in syphilis. Excision of the primary sore is a procedure of doubtful value, inasmuch as it is probable that the infection has become systemic long before the chancre has developed sufficiently to permit of recognition. In the local treatment of the initial lesion recourse may be had to calomel and similar dusting powders possessing treponemicidal properties. Dithymol diiodide also is a valuable remedy in some instances. In the "mixed lesions" due to infection with both the spirocheta pallida and the Unna-Ducrey bacillus, preliminary cauterization (with pure nitric acid) may be practiced, or the liberal application of a 25 per cent aqueous solution of argyrol may be tried. In the treatment of uncomplicated lesions, however, the employment of cauterization and similar measures is seldom beneficial, and may prove positively harmful. Nonulcerative syphilides require no local treatment. The regression of pustular lesions may be hastened by the daily application of a 5 per cent ammoniated mercury ointment, or of strong alcoholic or aqueous solutions of the bichloride (1 to 500; or 1 to 1000). Ulcerative lesions should be cleansed daily with bichloride solution (1 to 2000), and covered with either moist bichloride packs (1 to 5000), or smooth cloths thickly coated with ammoniated mercury (10 per cent) or calomel (10 per cent) ointment. Should the ulceration be very extensive (an exigency which is fortunately rare in these days), the continuous bath may be employed to hasten cicatrization. In some instances a dusting powder (preferably

calomel or dithymol diiodide) proves more comfortable than either gauze packs or ointment dressings. Crusted and vegetating lesions should first be cleansed by the aid of starch poultices, followed by the bichloride spray, penciled, if necessary, with silver nitrate, and later dressed with antiseptic powders. Sluggish granulating areas can be stimulated by the application of weak solutions of silver nitrate (5 to 10 per cent), a fact which has been emphasized by Zeisler and others. The same agent often proves a valuable aid in hastening the healing process in obstinate fissures and in mucous patches.

In order to avoid the occurrence of the latter, the teeth should be carefully inspected from time to time by a competent dentist, and all rough edges should be carefully ground down. The frequent employment of a good tooth paste (those containing a liberal percentage of potassium chlorate are to be preferred) is to be insisted upon, and in some instances it is necessary to prohibit entirely the use of tobacco if the patient's mouth is to be entirely free from mucous plaques. Other remedies which hasten the disappearance of these troublesome lesions are lactic acid, tincture of iodine, and solutions of methylene blue and pyoktannin blue.

In syphilitic alopecia the best results follow the use of stimulating local applications (a 1 to 1000 solution of bichloride of mercury in alcohol, to which has been added .2 per cent of castor oil, is one of the best), together with vigorous constitutional treatment. The palmar and plantar syphilides often prove extremely resistant to all therapeutic measures. Ormsby recommends hot ablutions, followed by mercurial or tarry ointments, and Pusey favors a 1 to 1000, or stronger, solution of bichloride of mercury in tincture of benzoin. Often the employment of salicylic plaster (20 per cent), followed by an ointment containing ammoniated mercury (10 per cent) and tar (10 per cent) proves helpful. With respect to the constitutional treatment in these cases, I have found injections of mercurous salicylate far more effective than the arsenical preparations.

Duration of Treatment.—Experience has proved that even with the modern, intensive method of treatment, very few cases of syphilis are cured before the end of the first year, and that the majority require at least two, and sometimes three, years of active medication. At the end of a year and a half of treatment, if all goes well, serum tests may be instituted looking forward to discontinuance of treatment. If no clinical evidence of the disease is to be found, a six weeks' vacation from medicine is taken, and at the end of that time

a blood test is made. The original Wassermann technic is preferable, although in experienced hands Noguchi's modification is reliable (incidentally, too much faith should not be placed on the result of a single test at any time, no matter how reliable and skilled the serologist may be). The fact that the blood of a patient who is under the influence of alcohol will usually give a negative reaction, and that the presence of ether in the blood will give rise to a positive reaction, whether or not syphilis is present, should always be borne in mind. Should the examination at this time prove absolutely negative, a further rest of three months is taken, providing, always, that no fresh lesions crop up, and a second examination made. If still negative, a further rest of six months, and a third test. A year later, a final serum examination is made. Should any of the analyses show a positive reaction, treatment is immediately instituted and continued for at least three months. A so-called "provocative Wassermann," which is carried out by first administering an intravenous dose of arsphenamine and, 24 hours later, withdrawing blood for a serum test, often proves as valuable in determining the status of the disease at this time as it does at the beginning of the attack. In many instances fluid drawn from the spinal canal gives a positive reaction long after the blood serum ceases to show the presence of the disease; consequently, in every instance, it is well to examine material from this region also before giving the patient a final clean bill of health.

Plan of Treatment.—While syphilographers differ widely in their views regarding the general treatment of the disease, the majority agree upon two points: arsenic and mercury are preferable to either drug alone, and the earlier treatment is instituted the more likelihood there is of ultimately bringing about a cure. A favorite plan of treatment is to administer from four to six doses of neoarsphenamine intravenously, and follow this by an intramuscular injection of 9 grains (0.6) of arsphenamine. Later, a series of mercurial inunctions or injections are given; and, in the course of from two to four months, arsphenamine is again employed. The two drugs are thus alternated for a period of from one to two years. While neither arsphenamine nor neoarsphenamine exerts much serological influence, both are powerful symptomatic remedies, and the cutaneous improvement which follows their employment is at times little short of marvelous. For this reason, arsphenamine should be administered in all cases of the disease which present marked cutaneous (or mucous) involvement. Owing to its greater efficiency, arsphenamine is to be preferred to neoarsphenamine,

and clinical observation, as well as the results of Craig's serological studies, has shown that the intramuscular route is by far the most valuable. Consequently the older drug should always be employed if it is procurable, and the intramuscular method should be given preference. The line of treatment which I usually employ may be delineated as follows: A diagnosis of syphilis having been made, the patient is informed of the nature and course of the disease and the danger of communicating it to others, and instructed regarding the care of his teeth. The urine is then examined, and the blood-pressure taken. If the urine is normal, and the arterial tension not excessive, the patient is given a cathartic (2 Compound Cathartic pills, U. S. P., followed by a saline), and, after the bowels have acted freely, a dose of morphine is administered hypodermically. One hour later, 0.6 grm. of an alkaline solution of arsphenamine is given, intramuscularly, in the gluteal region or the lumbar region, the dose being equally divided between the two sides. Following the first dose of arsphenamine, active mercurial treatment, preferably by injection of the salicylate, twice weekly, is instituted, and continued for three months. If circumstances render the injection method impracticable, daily inunctions of mercurial ointment (pushed until the physiological effect is obtained), with a hot or Turkish bath once or twice weekly, constitute the next most efficacious plan. At the end of three months, all mercurial treatment is stopped for a fortnight (in order that the kidneys, if in an irritated state, will have an opportunity to recuperate), and the arsphenamine therapy repeated. After a brief rest the mercurial routine is again taken up, and continued for a second period of three months. In a few instances, nine months of treatment, as here outlined, is sufficient permanently to arrest the course of the disease, but such instances in the writer's experience are rare, and in the absence of reliable laboratory assistance and opportunities for frequent clinical inspection it is wiser to continue the treatment more or less vigorously for at least two years. After the first twelve months, small amounts of iodide, preferably the sodium salt, may be advantageously employed. If the disease has been present for some time when the patient comes under observation, the iodide may, of course, be used from the beginning. In some instances, particularly in syphilis involving the nervous system, large amounts of this drug may be required before the desired result is obtained, but in the majority of cases I seldom go above 10 to 15 grains (0.7 to 1.0), after each meal. It is best taken in aqueous solution, followed by a glass of sweet milk or milk and cream.

Treatment of Inherited Syphilis.—An expectant mother who is known to be a syphilitic should receive active treatment throughout her pregnancy, for the sake of her own health as well as that of the child. It is very essential to the future of the infant that it be nursed at the mother's breast, and every effort should be made to maintain its nutrition at the highest possible point. Should there be no active manifestations of syphilis present at birth, treatment need not be instituted until the first positive symptoms of the disease appear. The treatment, when begun, varies but little from that of the acquired form of the malady. Cleanliness is even more important here than in the adult. The nose should be kept clean, the folds of the skin free from moisture and dirt, and any mucous patches or condylomata that may develop should receive immediate attention. Frequent baths, followed by the liberal application of bland dusting powders, are usually essential. The constitutional remedies upon which greatest reliance is to be placed are mercury and arsenic. Hunt speaks highly of the bichloride, by ingestion, and Neff, who has had wide experience in the treatment of this disease in infants, follows Holt's suggestion, and gives neoarsphenamine (0.075 to children under six months of age, and 0.15 to those over six months), intravenously, every two weeks for four doses, then once monthly thereafter. Any prominent vein may be employed. In the intervals mercury is given, preferably by inunction, or in the form of gray powder by the mouth.

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FRAMBESIA.

Synonyms.—Yaws; Pian; Tonga.

Definition.—An infectious, endemic disorder, peculiar to certain tropical countries, which is probably due to the spirocheta pertenuis, and is characterized by an eruption of papules which ultimately develop into raspberry-shaped masses.

Symptoms.—The disorder occurs in Northern Africa, Algeria, Madagascar, Asia, Australia, and the West Indies. The course of the disease may be roughly divided into three stages; a prodromal stage, or stage of incubation, which varies in length from two to several weeks or longer, and is distinguished by the appearance of the primary lesion ("mother yaw"); a secondary period which commences with the appearance of the generalized, papular eruption, in from one to three months after the development of the mother yaw, and persists for several weeks or months, to be followed ultimately by a third stage, in which gummatous lesions, often accompanied by ulceration, are the predominant feature. The incubation period is characterized by constitutional symptoms of variable degree. The primary lesion varies considerably in appearance. It may be papular, nodular or even pustular, and usually is accompanied by more or less itching. It may develop on any part of the body, although the extremities, hands, and face are the favorite sites. Not uncommonly the lesions develop on the breasts of nursing mothers, and at the corners of the mouths in suckling infants. The primary papule may heal spontaneously, or as a result of local treatment, with slight resultant scarring, but often

it undergoes ulceration, increases in size, and becomes papillomatous. Preceding the appearance of the secondary eruption, there is usually a recrudescence of the systemic disturbance, but the fever, backache, and joint pains quickly or slowly subside following the development of the cutaneous lesions. The papules are rounded or conical in shape, and distributed more or less symmetrically. As they increase

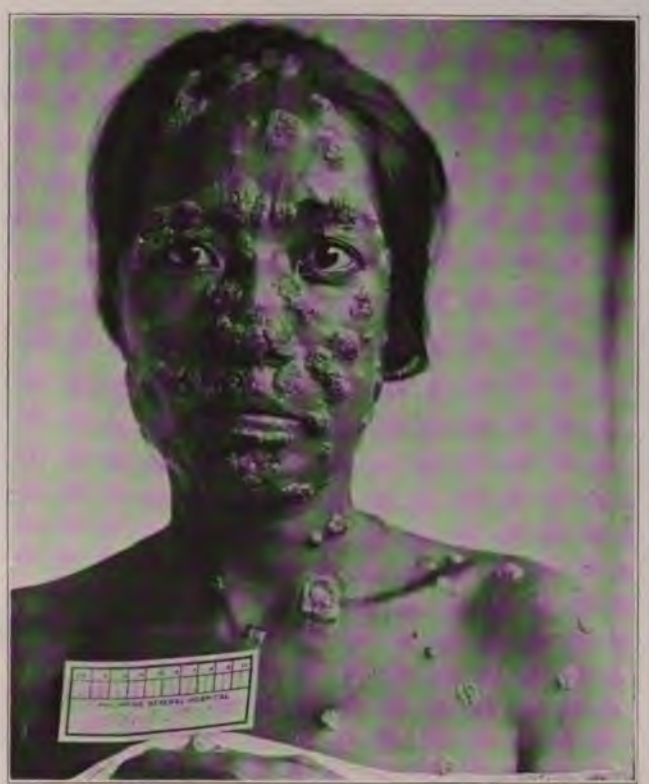

Fig. 691.—Yaws, secondary lesions. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

in size, many may exhibit slight central umbilication, not unlike the beginning pustules of variola. A few of the lesions disappear spontaneously, leaving either dark pigmented or whitish, atrophic spots, but the majority usually persist, and ultimately, in the course of a few weeks or months, become nodular, granulating, raspberry- or cauliflower-like masses, which are partially covered with yellowish crusts. The inspissated exudate has a peculiarly offensive and distinctive

Fig. 692.—Yaws, showing lesions on trunk and arms. (Courtesy of Dr. S. A. Winsor, Matale, Ceylon.)

Fig. 693.—Yaws, showing lesions on hands and feet. (Courtesy of Dr. S. A. Winsor, Matale, Ceylon.)

Fig. 694.—Yaws. (Courtesy of Dr. S. A. Winsor, Matale, Ceylon.)

odor. Coalescence may occur, with the formation of patches, and these, in turn, may break down and ulcerate in the center, giving rise to circinate plaques of various sizes and shapes. Or central involution may occur, with the development of peculiar, ring-shaped lesions (ringworm yaws). The flexor surfaces of the hands and feet are occasionally the sites of numerous small, hard, nodular protuberances which, when removed, leave deep, pit-like depressions. The mucous membranes may be involved, but this occurs only incidentally. Lymphnode involvement also is not a characteristic feature of the

Fig. 695.—Yaws, showing lesions on breast of mother and lips of child. (After Henggeler.)

disease. The duration of the secondary period varies. As the older lesions heal, new ones frequently crop out, and by this means the eruptive stage may be prolonged for months. As a rule, however, it does not extend over a period greater than from three to six months in children, and from six to eighteen months in adults. The so-called tertiary stage is absent in a considerable percentage of cases. When it does occur, it is characterized by the formation of gummatous and ulcerative lesions of the bones and other deep structures as well as the skin, the symptoms closely simulating those of tertiary lues.

Etiology.—According to McCarthy, native children between the ages of 1 and 10 are the most frequent victims of the disease. Overcrowding, and poor hygienic surroundings are predisposing factors. It is extremely probable that the disorder is due to infection with the spirocheta pertenuis (Castellani) an organism which resembles the

Fig. 696.—Yaws. (Courtesy of Surgeon A. J. Geiger, U. S. Navy.)

Fig. 697.—Yaws. (After Henggeler.)

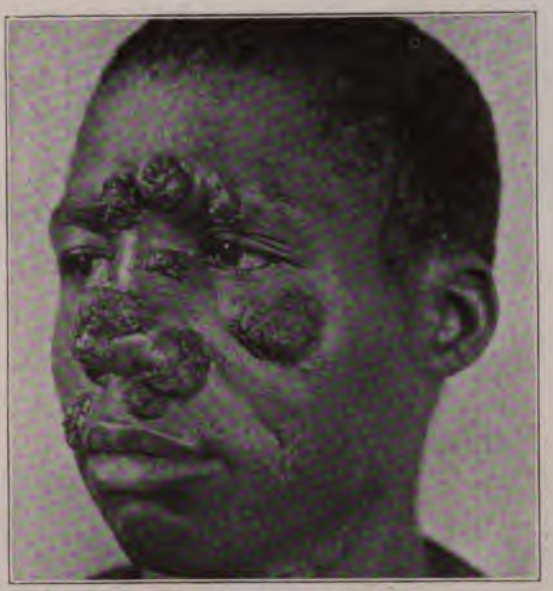

Fig. 698.—Secondary yaws. (Courtesy of Dr. Isadore Dyer.)

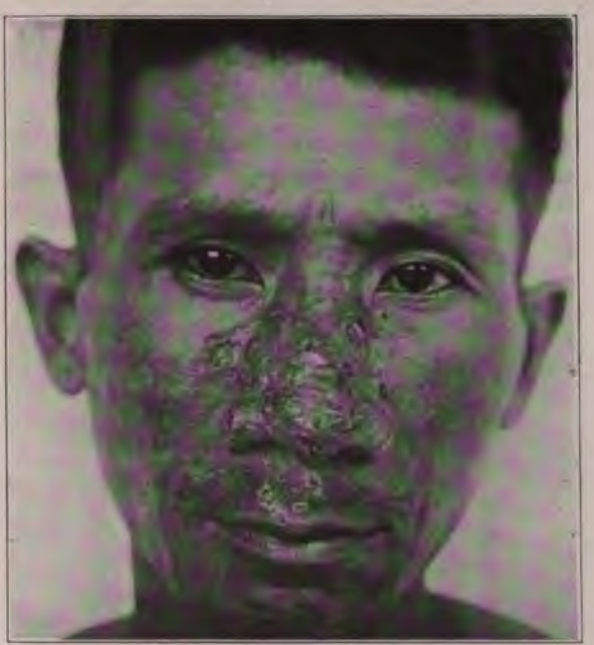

Fig. 699.—Yaws, of the so-called malignant type. (Photograph by Bureau of Science, Manila, (Dr. John A. Johnston, Acting Director.)

Fig. 700.—Yaws, showing typical mulberry and raspberry lesions. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

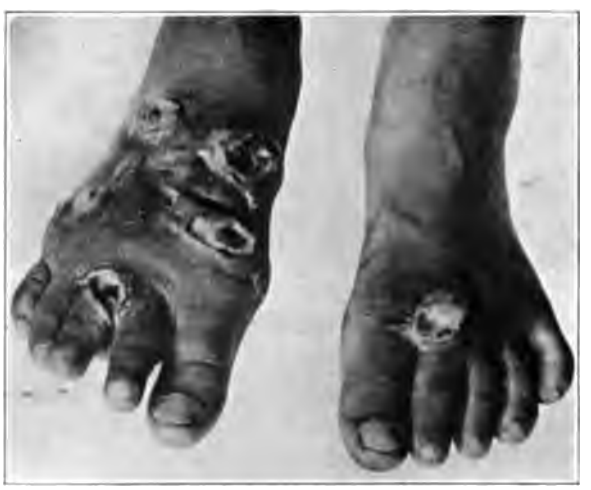

Fig. 701.—Yaws. Note the resemblance of the lesions to those of tertiary syphilis. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

spirocheta pallida in many respects. It is possible, as Pernet and others have suggested, that the peculiar contour of the frambesiform lesion is largely a result of secondary infection with staphylococci and other micro-organisms.

Pathology.—MacLeod found widespread plasma cell infiltration, but the cell collections bore no relationship to the distribution of the blood vessels (as in syphilis). In addition to plasma cells, numerous mast cells, and connective-tissue and round cells were irregularly scattered through the derma. The capillaries were dilated, but ex-

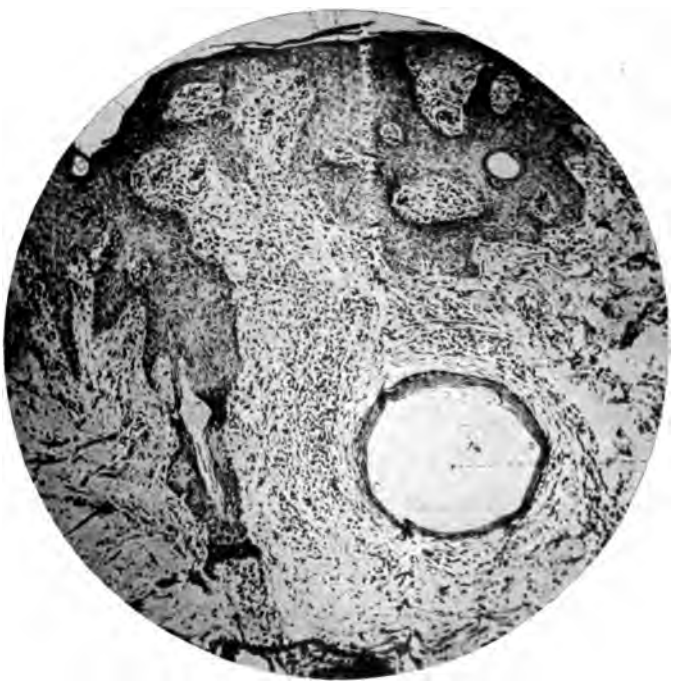

Fig. 702.—Yaws. Early papule from monkey. Showing epithelial downgrowth, and central degeneration, with capillary dilatation in edematous corium. Moderate magnification. (Courtesy of Drs. Ashburn and Craig.)

hibited no evidence of the presence of inflammation (such as occurs in syphilis). The hair follicles and the skin glands were unchanged. There was thickening of the prickle layer, and the stratum corneum was parakeratotic.

Diagnosis.—The malady bears a superficial resemblance to syphilis. The Wassermann test is usually positive in frambesia, but the fact that the primary lesion is extragenital, and the mucous mem-

branes and lymphnodes are seldom involved, together with the fact that the eruption, while at first papular, later bears little or no resemblance to the exanthem of lues, should serve for differentiation. In case of doubt, recourse may be had to a microscopic examination of an excised nodule.

Prognosis.—The disease seldom threatens life, and as a rule one attack confers immunity. Europeans are less susceptible to the infection than natives, but when they do contract the disorder they recover much more slowly (Graham). The average duration of the malady is from six to twelve months, but this can be greatly shortened by appropriate treatment.

Treatment.—Cleanliness, the employment of hygienic measures, and plentiful amounts of simple, nutritious food, all are valuable aids. The local treatment is largely symptomatic. Of the various constitutional remedies that have been recommended, mercury and the iodides long shared first place. Recently, Strong, de Boissiére, and others have reported brilliant and uniformly successful results following the administration of arsphenamine. In several instances a single dose (9 grains—0.6) has proved sufficient to bring about a cure. Spittel, who has had a wide experience in the treatment of the disease, speaks highly of large doses of mercuric and arsenious iodides, with sodium iodide, administered intravenously.

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ESPUNDIA.

Synonym.—Uta.

McEwen has recently called attention to a cutaneous disorder of the tropics called Espundia. It is found in the great rubber district of South America, comprising parts of Brazil, Bolivia, Peru, Ecuador and Colombia, and is described by Escomel as follows: "It is especially prevalent near the river Madre de Dios; there is a primary lesion,

the 'espundic chancre,' which may appear on the neck, chest, back, shoulders, arms or legs, and consists of a variable-sized ulcer with raised edges and granulomatous floor. Healing eventually occurs with scar formation and after some years, ulcerations of a severe and persistent type appear in the nose, mouth, on the palate, and larynx. This condition may continue for years without grave interference with

Fig. 703.—"Uta" or "Espundia." (Courtesy of Dr. Isadore Dyer.)

the victim's health." Destruction of the bony structures within the nasal cavity may cause flattening of the nose; the furrows intersecting the masses of granulations in the mouth are very often so disposed as to form a cross in the region of the palate, and Escomel thinks this appearance is characteristic enough to be worthy of a name, "the palatine cross of Espundia."

Santamaria describes espundia in Colombia as presenting peduncu-

lated, pea-sized lesions which ulcerate and leave an abrasion which is difficult to heal.

In 1912, Laveran and Nattan-Larrier reported the discovery of Leishmania tropica in an espundia lesion, but the usual rounded tropho-nucleus was replaced by a crescentic nuclear mass lying at the periphery of the organism, consequently they suggested that the species of Leishman body present probably differs somewhat from the ordinary variety. Wenyon states that he has noted a similar arrangement of the tropho-nucleus in cases seen in Bagdad, and suggests a possible relationship to oriental sore. Histologically, the main difference appears to be a greater local involvement of the lymphatic system in the espundic lesions.

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GANGOSA.

Synonym.—Rhinopharyngitis mutilans.

Definition.—An acute or chronic inflammatory, ulcerative, granulomatous process which involves the soft and hard palate and contiguous structures, and is probably due to the spirocheta pertenuis of Castellani.

Symptoms.—The disorder is particularly prevalent in Guam, although cases suggestive of gangosa (a Spanish word which means "muffled voice") have been reported as occurring in Italy, Jamaica, the Fiji Islands, Panama, and the Philippines. The malady is practically confined to the native population of these countries, only one undoubted instance in a white man having been recorded (Stitt's case). This patient had previously spent several years in Guam. The onset of the attack may be accompanied by constitutional symptoms of variable severity, but these usually subside quickly. As a rule the process gives rise to little or no pain. According to Leys and Mink and McLean, the earliest clinical manifestation is a superficial ulceration of the pharynx, either on the posterior wall, or on the posterior surface of the faucial tonsil. The course of the destructive process may be rapidly progressive, but is generally slow, and marked by periods of comparative quiescence. In the course of months or years the ensuing deformity may be very great, the palate,

lips, nose, and even the eyelids being destroyed in some instances. The malady is infectious, and is transmitted by direct contact.

Etiology.—Geiger, who has devoted much time and study to the

Fig. 704.—Gangosa, early stage of disease. (Courtesy of Surgeon A. J. Geiger, U. S. Navy.)

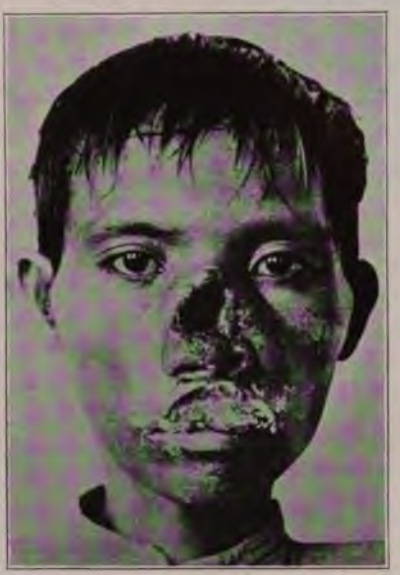

Fig. 705.—Gangosa. (Courtesv of Drs. Musgrave and Marshall.)

Fig. 706.—Gangosa. (Courtesy of Surgeon A. J. Geiger, U. S. Navy.)

Fig. 707.—Gangosa, showing healed and cicatrized lesions. (Courtesy of Dr. A. J. Geiger, U. S. Navy.)

Fig. 708.—Gangosa, advanced stage of disease. (Courtesy of Surgeon A. J. Geiger, U. S. Navy.)

affection as encountered in the Island of Guam, isolated an organism closely resembling the diphtheria bacillus from many of the cases which he investigated, but in a recent personal communication he

states he now feels convinced that the condition is not a disease *sui generis,* but a late manifestation of yaws. He has observed typical cases of frambesia in which the lesions situated about the nose and upper lip broke down and ultimately developed into typical cases of gangosa. He believes that the breaking down of the granulomatous structures is largely a result of secondary infection, and that the most frequent bacterial invader is the organism which he at first thought to be causative.

Fig. 709.—Gangosa, advanced stage. (Courtesy of Surgeon A. J. Geiger, U. S. Navy.)

Pathology.—The histology of the condition has been studied by Fordyce, Geiger, Musgrave and Marshall, and others. Structurally, the lesions are granulomatous and contain numbers of plasma, mast, epithelioid, and giant cells. In Musgrave and Marshall's case there was a concomitant tuberculous infection, but the result of Fordyce's careful and exhaustive investigations (which included experimental inoculation of animals) ruled out this disorder as a causative factor.

Diagnosis.—The condition is to be distinguished from syphilis,

Vincent's angina, and tuberculosis. The lack of response to mercury and the iodides is the strongest argument in favor of a non-syphilitic origin. A careful microscopic examination of material from the throat should enable one to exclude Vincent's malady. The absence of a marked reaction to tuberculin, and the character of the histologic changes are sufficient to exclude tuberculosis. In doubtful cases recourse should be had to animal inoculation.

Prognosis.—Death seldom if ever occurs as a direct result of the disease, but if neglected the disorder is liable to give rise to frightful deformity. Segregation, and the adoption of proper hygienic measures are always indicated.

Treatment.—Mink and McLean found tincture of iodine the best local medicament. Active cauterization proves beneficial in some instances. The constitutional remedies thus far employed have proved of doubtful value. Arsphenamine, sodium cacodylate, and similar arsenicals should be tried.

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LEPRA.

Synonyms.—Leprosy; Elephantiasis Græcorum; Leontiasis.

Definition.—Leprosy is a chronic, infectious malady, due to the bacillus leprae of Hansen, characterized by alteration and destructive changes in the cutaneous, nervous or bony structures of the body.

The history of this disease dates back as far as that of man. It is extremely probable, however, as McEwen has stated, that the word "leprosy" as biblically employed, did not always refer to true leprosy, but was rather a generic term covering various sorts of skin disorders, which rendered the one afflicted "unclean" and disqualified him for the worship of Jehovah. The affection was a common one in England and on the continent during the early and Middle Ages, but it gradually subsided in the fourteenth and fifteenth centuries, and at present exists only in small foci in various parts of the world. At present Iceland probably contains the greatest number of lepers in proportion to the total population, although the disease is a not uncommon one in Norway, Sweden, Southern Russia, Japan, Mexico, Central and South America, the Sandwich Islands, and the Philippines. Occasionally cases occur in some of the British Island colonies, par-

ticularly New Zealand and the West Indies, as well as Canada (Tracadie) and Spain, and Portugal, Italy, and Greece supply a considerable number. In addition to the small foci in New Brunswick and Manitoba, Louisiana and Minnesota contain the majority of the North

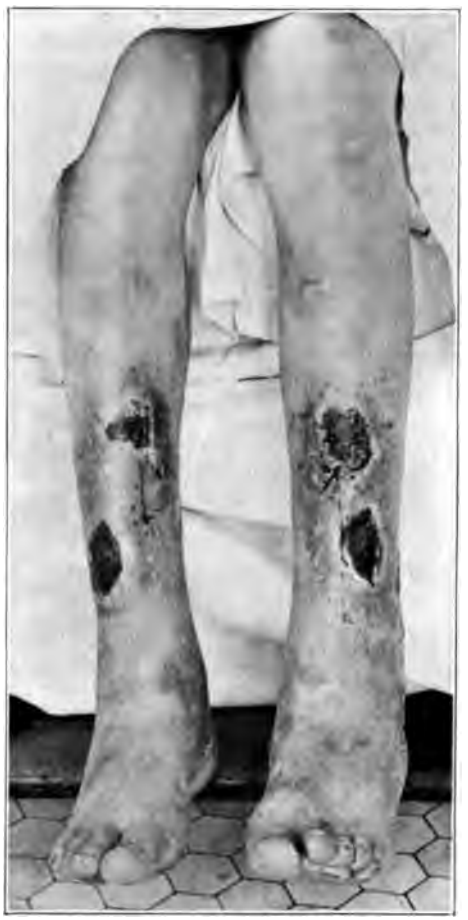

Fig. 710.—Ulcerative lesions in a case of nodular leprosy. (Courtesy of Dr. Murray C. Stone.)

American cases, although sporadic examples of the disease are not very unusual in the Pacific and Atlantic seaboard cities, as well as the larger centers of population elsewhere in the Union. The majority, if not all, of these cases are imported from the West Indies, Mexico, China, Norway, Russia, and elsewhere.

Symptoms.—The symptomatology of the disease is variable, and

owing to this fact three clinical forms are recognized: (1) a nodular or tubercular form (the "Lepra tuberosa" of Hansen and Looft); (2) a macular, or anesthetic form (the "Lepra maculo-anesthetica" of Hansen and Looft); and (3) a mixed type. According to Crocker, the nodular form is the most common in Europe. the maculo-anesthetic in the tropics, and the mixed is nearly always less common than either of the others. In all forms the period of incubation is extremely variable, from a few weeks to many years.

Lepra Tuberosa (Tubercular or Nodular Leprosy).—In this type, which is characteristic of the more virulent forms of the disease, the cutaneous lesions are at first ill-defined reddish macules, but later the skin becomes infiltrated, thickened, and nodular, and at the end of a few months or years it often presents a yellowish, glossy, varnished appearance which is quite striking. The occurrence of the cutaneous changes is usually preceded by constitutional disturbance of variable intensity and duration. This stage of invasion, as it is sometimes called, frequently lasts for several weeks or months, and is accompanied by fever, headache, joint pains, attacks of sweating, and, occasionally, epistaxis. Weakness and general malaise are commonly present, and alterations in sensibility, particularly hyperesthesia in localized areas, are not unusual. Aside from the symptoms of constitutional involvement, which are generally so vague and ill-defined in character that they are void of diagnostic significance, the changes in the mucous membranes of the upper air passages are usually the first perceptible manifestations of the malady (Morrow). In addition to rhinitis of variable degree, always accompanied by a more or less profuse catarrhal discharge, laryngitis, with consequent voice changes, and excessive salivation are fairly common. The earlier cutaneous manifestations are those suggestive of a toxic erythema rather than a chronic constitutional disorder. Although a few irregularly scattered bullae may appear from time to time, the major portion of the eruption consists of numerous reddish or purplish, erythematous patches, the sites of predilection being the face and the extremities. The course of these lesions varies greatly. Many disappear, often with slight resultant brownish pigmentation, but a few usually persist, and while these may ultimately become the seats of infiltration and thickening, the plaques and nodules which subsequently appear commonly develop independently of the erythematous areas. The tubercles and nodules are rounded or oval in outline, brownish in color, and of firm consistence. They may dis-

Fig. 711. Nodular leprosy. (Courtesy of Dr. Howard Morrow.)

Fig. 712.—Tubercular leprosy in an early stage. Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

Fig. 713.—Tubercular leprosy, early stage of infiltration of ear. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

Fig. 714.—Tubercular leprosy, with papillae-like nodules. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

appear spontaneously, and be succeeded by another and more pronounced crop of tumors, or they may persist unchanged. While the

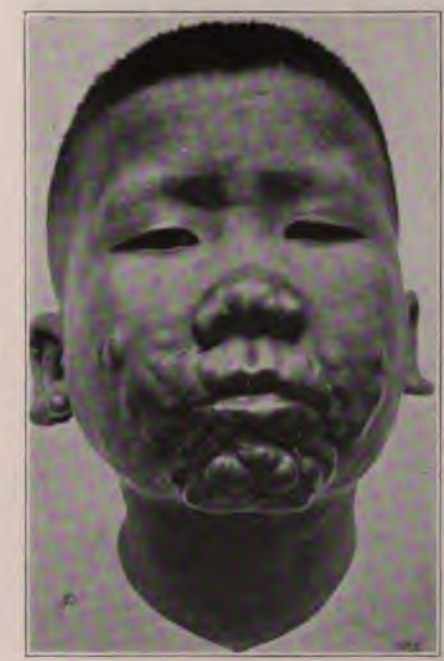

Fig. 715.—Nodular leprosy involving the chin, cheeks and ears. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

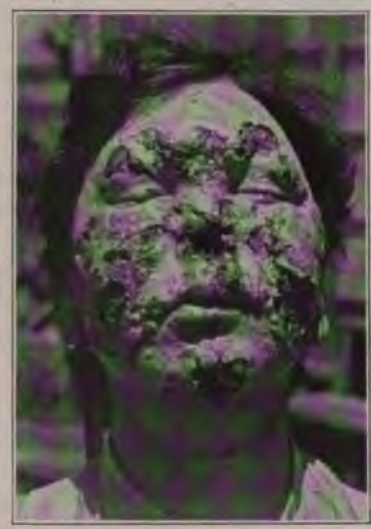

Fig. 716.—Nodular leprosy, showing extensive ulceration. (Courtesy of Dr. Howard Morrow.)

Fig. 717.—Tubercular leprosy of the hand, showing characteristic nodules.

course of the malady is steadily progressive, remissions are not uncommon, particularly in the early stages of the disease. Not infre-

quently, and particularly if the nodules are located in regions exposed to trauma (as on the fingers and knuckles), ulceration takes place. The subsequent course of the lesion varies. Healing, with the formation of smooth, flexible cicatrices, or of hypertrophic, fibrous masses, may supervene, or the ulcers may persist indefinitely, as raw, oozing surfaces, partially covered with thick, reddish-brown crusts. The face and forehead are the favorite sites for the leprous nodules, and the resultant thickening and infiltration of the skin in this region often gives rise to great deformity (leontiasis). The mucous membranes of the mouth, nose and pharynx seldom escape, and the conjunctiva and cornea likewise are frequently involved early in the course of the disease. Aside from a slight alopecia, due to the general toxemia, the scalp suffers but little, although the eyebrows are usually much damaged as a result of direct involvement. Occasionally the nails become altered, owing to nutritive changes, and disturbance, or even complete loss of function, of the skin glands in a few or several areas is not uncommon. The lymphnodes are seldom affected primarily, but only as a result of secondary (staphylococcic) infection.

Lepra Anesthetica (Anesthetic Leprosy: Lepra Nervorum).—In this form, which is the less virulent type of the disease, the bacilli appear to exert a preference for the neuroglia of the nerve trunks, and consequently the predominant symptoms are those resulting from nervous changes. The precursory manifestations differ but little from those occurring in the tubercular form, although even at this stage the nerve involvement, as shown by the hyperesthesia, the neuralgic and lancinating pains along the course of the involved trunks, and the distribution of the macules and bullae, overshadows the usual toxic symptoms. The course of the malady is extremely slow, many years often being required for the development of the characteristic clinical symptomatology. The great auricular, ulnar, and peroneal nerves become palpable and tender at a comparatively early stage of the disease. In addition to the usual signs of neuritis, areas of hyperesthesia develop at the points of terminal distribution. Ultimately, as atrophy succeeds inflammation and irritation in the trunk of the affected nerve, the ability to convey sensation is lost, and the hyperesthesia gives way to anesthesia. Owing to the fact that each trunk consists of large numbers of fibrils, some of which may be normal, others inflamed, and still others atrophic, the involved region may present both hyperesthetic and anesthetic areas.

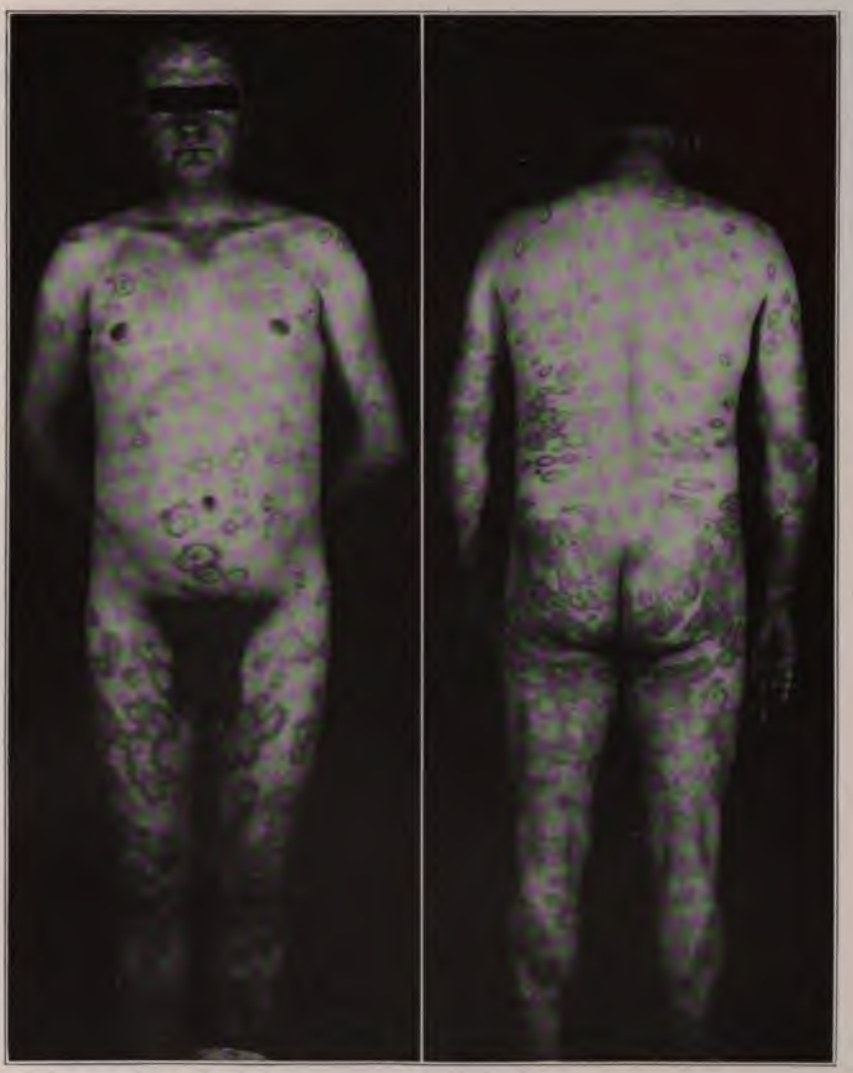

Fig. 718.—Maculo-anesthetic leprosy. (Courtesy of Drs. Engman and Mook.)

The characteristic cutaneous eruption appears at the end of several months or years, and consists of rounded, oval, or irregular, reddish, brownish or yellowish, sharply defined macules (the neuroleprides of Unna), which vary from 3 to 10 centimeters in diameter, and are distributed in a somewhat symmetric manner over the limbs, shoulders, and back. At first they are slightly pruritic, but later, as

regression and atrophy occur, they become anesthetic. Occasionally the patches coalesce, with the formation of gyrate or polycyclic figures. Bullae frequently develop, but usually rupture quickly, although there may be some resultant scarring. Nutritional changes occur both in the vicinity of the patches and in the skin and other tissues of the affected limbs. The glands cease to act, and the integument becomes thin, dry, harsh, and inelastic. The hair on the affected areas loses its pigment, and the nails exhibit atrophic and degenerative changes. Owing to the anesthesia present, the patients frequently injure the parts unconsciously, and ulceration and infection are

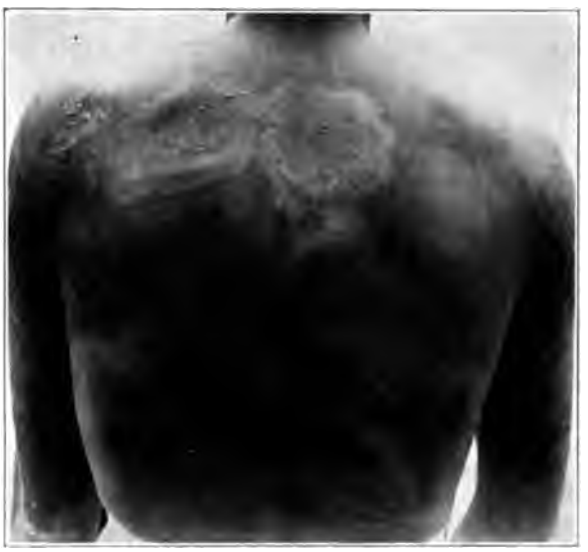

Fig. 719.—Anesthetic leprosy of trunk. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

not unusual. Ultimately, owing to the paralysis and atrophy of the extensor muscles of the forearm, and the interosseous muscles of the hand, the fingers may become flexed and immovable ("leper claw"). Perforating ulcers of the foot are not unusual, and, as a result of absorption, or of disintegration and sloughing, the fingers on one or both hands may be lost. In the facial region the nerve changes result in paralysis of the orbicularis palpebrarum, orbicularis oris and other muscles, with more or less ensuing disfigurement. More serious than the deformity, however, are the destructive changes which occur in the cornea as a result of the patient's inability to close the lids.

Mixed Type.—The mixed type of leprosy is often represented by a well-defined example of either the tubercular or anesthetic form of the disease which has gradually developed symptoms of the other variety of the malady, and at the same time continues to retain its earlier clinical characteristics. Occasionally, however, a case is encountered which is a mixed one almost from the beginning, at no time presenting a symptomatology distinctive of either form of the disease.

Fig. 720.—Anesthetic leprosy, showing typical hands, atrophy of interossei, and contractures, with trophic ulcer of right hand. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

Etiology.—Leprosy is due to a specific organism, the bacillus leprae, which was discovered by Hansen, in 1874. Fraser and Fletcher have shown that the diphtheroid organism isolated by Kedrowsky,

and later by Bayon, and thought to have a genetic relationship with Hansen's bacillus, is not pathognomonic of leprosy.

The exact mode of inoculation is not known. It is probable, as Currie and others have shown, that the bacilli can be transmitted by flies, and possibly by bedbugs (Goodhue and Long), or acari (Heiser). The organisms are found in the saliva, the nasal discharges, the urine, the semen and feces, and are usually present in immense numbers in the secretions from the ulcers. The fact that the organisms are usually very plentiful in the nasal secretions, and on the surface of the nasal mucosa, even in the earlier stages of the disease, is highly suggestive, and Morrow and other authorities believe that

Fig. 721.—Anesthetic leprosy, showing typical deformity of hands. (Photograph by Bureau of Science, Manila, Dr. John A. Johnston, Acting Director.)

the bacillus gains entry to the body at some point in the upper respiratory tract. In the majority of instances infection occurs only as a result of close personal contact. Certain predisposing factors undoubtedly exist, and food, habits, and general environment probably exert more or less influence upon the successful implantation of the organism. As Crocker has stated, some other factors besides the introduction of the microbe into the body are required. It is now generally accepted that the malady is not a highly contagious one, and the majority of authorities agree that if any hereditary predisposition to the disease exists, it is less marked than that commonly observed in tuberculosis. The affection may be contracted at any age, although the majority of cases develop during the third and fourth

decades of life. While it is generally agreed that the anesthetic type of the disease is mildest of all, the essential cause of this lessened virulence has not yet been discovered. It is possible that in leprosy, as in syphilis, certain strains of organisms may exhibit a predilection for the nervous tissues.

Pathology.—Leprous nodules are infective granulomata, and consist of masses of partially reverted connective tissue cells, with intermingled lymphocytes, plasma cells, and mast cells. Scattered

Fig. 722.—Bacillus leprae. Smear from a nodule, stained with carbo-fuchsin and methylene blue. A lepra cell is also shown. (Courtesy of Dr. L. S. Schmitt.)

through the growth are variable numbers of large, ovoid cells (lepra cells), the majority or all of which contain bacilli. Unna holds that this so-called lepra cell is not a cell at all, but a gloea-like mass which is formed as a result of bacillary degeneration. The organisms also exist independently of the lepra cells, and occur in considerable numbers in the walls and endothelia of the capillaries which penetrate the diseased areas, as well as in the connective tissue sheaths of the nerves.

The cellular infiltration commences around the vessels and glandular structures, and is practically confined to the corium, the epidermis being involved only secondarily. The macules in the anesthetic type of the disease contain very few bacilli, although the contiguous nerve trunks are always involved. In addition to the cutaneous changes, many of the internal organs, particularly the liver and the spleen, are affected. The histologic appearance varies somewhat in the various cases, but the presence of large numbers of bacilli usually can be readily demonstrated. The leprosy bacillus is an acid-fast organism, which averages from 4 to 6 microns in length, and resembles the tubercle bacillus in many respects. Recently it has been cultivated on artificial media by Duval, Wellman, Clegg, Currie, Holman and others, and several investigators have succeeded in inoculating animals with the disease.

Diagnosis.—As a rule the true nature of the earlier (systemic) manifestations of the malady would be unrecognized in other than leprous communities. With the development of the erythematous stage, however, suspicion should be aroused, particularly if there are any accompanying disturbances of sensation. A history of exposure can sometimes be elicited, and this evidence, together with the tedious evolution of the lesions, and the frequent presence of more or less infiltration, should serve to put the observer on his guard. The aftercourse of the plaques, and the subsequent development of tubercles and nodules, or of neuroleprides, would, of course, prove confirmatory. As Ormsby states, however, the quickest and most certain method of diagnosing the disease is by the recognition of the bacilli in the affected tissues, in serum or blood obtained from the lepromatous nodules, or in the nasal discharges. In the examination of tissues he recommends the antiformin method.

The diseases which are most liable to be confused with leprosy are syphilis, granuloma fungoides, syringomyelia, lupus vulgaris, morphea, and vitiligo. Syphilitic lesions usually pursue a comparatively rapid course, and never exhibit sensory changes. The characteristic infiltrations of leprosy are wanting, even though the history of exposure be present. Dependence cannot be placed on the Wassermann test as a differential agent, however, owing to the fact that leprosy frequently reacts positively, consequently in suspicious cases recourse should be had to a biopsy. In granuloma fungoides, the earlier systemic symptoms of leprosy are absent, the infiltrated areas are seldom sharply circumscribed, and there is usually a history of occurrence of eczematous and pruritic manifestations at some

time during the earlier stages of the disease. Sensory changes are seldom if ever present in granuloma fungoides. Syringomyelia exhibits a preference for the upper extremities, the areas of disturbed sensation are ill-defined, and the tendon reflexes are usually diminished. Paraesthesia usually is present. In lupus vulgaris the localization and course of the lesions, the lack of symmetry, and the absence of all prodromal and concomitant symptoms of leprosy should prevent confusion. The lesions of morphea and of vitiligo are unattended by sensory changes, and other manifestations of leprosy are lacking. Crocker calls attention to the occasional superficial resemblance of early leprous lesions to those of erythema multiforme. In the absence of a reliable history this mistake can be made very easily (in fact, I once made it myself), but a careful consideration of the eruption, particularly with reference to its duration and the presence or absence of secondary changes, will usually enable one quickly to distinguish its true character.

Prognosis.—Few cases of leprosy recover spontaneously, and even fewer as a result of treatment. The tubercular form of the disease is the gravest, death generally occurring, as a result of the direct effect of the malady or from intercurrent disorders, in from seven to fifteen years. In the anesthetic variety the patient may survive for a score of years or even longer. In many instances life may be prolonged by the employment of appropriate treatment and the adoption of proper hygienic measures. Emigration apparently exerts a favorable influence in some cases, the disease afterward tending to disappear or at least to remain quiescent.

Treatment.—In view of the unfavorable outlook in practically all cases of the disease, prophylactic measures are of vital importance. The most essential step in this direction is the segregation of infected individuals. While a few states (Louisiana, California, Mississippi, and Massachusetts), have provided asylums for the unfortunate victims of this disease, the establishment of a national leprosarium, as repeatedly urged by Blue, Rucker, C. J. White, Dyer, Engman, and others, has at last become a probability, Congress having passed the bill necessary for its establishment late in 1916.

Of all the various agents that have been recommended in the treatment of leprosy, chaulmoogra oil (in doses of from 5 minims to 3 drams, 0.3 to 12.0 daily), is the one substance which, while not perhaps a specific, has best stood the test of time (Chipman). Unfortunately, large amounts of the drug are required in order to obtain results, and few individuals can tolerate the agent in adequate

doses for any considerable period of time. To obviate this feature, Heiser has suggested the hypodermic employment of a mixture of chaulmoogra oil, camphorated oil, and resorcin,

℞ Olei chaulmoograe .....ʒ ii (60.0)
Linimenti camphorae .....ʒ ii (60.0)
Resorcinolis .....3 ss (4.0)
Misce et signa: Shake and inject 15 minims (1. c.c.), once weekly. The amount is to be gradually increased until the point of tolerance is reached.

The camphorated oil is added in order to facilitate absorption, and the resorcin because of the beneficial results Unna has secured from the employment of mixtures of resorcin and chaulmoogra oil.

Of nine cases treated over a considerable period of time, Heiser obtained an apparent cure in one case, apparent clinical recovery in four, and marked improvement in three. The best results were secured when the mixture was injected directly into large leprous deposits. In addition to the hypodermic medication, saline purgatives were freely employed, and hot sodium bicarbonate tub baths were taken every second day.

Other remedies which have been highly recommended are gynocardic acid (the active principle of chaulmoogra oil), sodium gynocardate (Peacock, Spittel, Muir, and others), strychnia, bichloride of mercury, ichthyol, iodoform, gurjun oil, thyroid extract, and iron, quinine and arsenic, cod-liver oil, and similar tonics. Arsphenamine is apparently helpful in some instances. Vaccines and serums are as yet in the experimental stage, although "Nastin" and "Nastin C," fatty preparations elaborated by Decke, from cultures of a streptothrix which he isolated from leprous nodules, have proved disappointing, as have also Carrasquilla's serum, Rosts' "Leprolin," and Calmette's "antivenin." Recently, Campos has tried anthrax vaccine with encouraging results.

Of the various local agents that have been suggested, radiotherapy is probably the most valuable, as Morris, Ormsby, Wilkinson, and others have demonstrated. Unna employs ichthyol internally, and an ointment containing salicylic acid, ichthyol, and resorcin externally. The advisability of destroying the nodules by curettage or by means of the actual cautery (Vineta Bellaserra) is questionable. Ulcers, contractures, and mutilations are to be treated surgically.

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HYDROA VACCINIFORME.

Synonyms.—Hydroa æstivale; Hydroa puerorum; Recurrent summer eruption.

Definition.—A recurring, vesicular, summer disease which occurs chiefly in young males, and usually involves only the uncovered surfaces of the body.

Symptoms.—This somewhat rare affection was first accurately described by Bazin in 1861, and has since been studied by Hutchinson, J. C. White, Bowen, and others. The eruption first appears in early life, and the disease gradually subsides following puberty. The lesions develop in crops and consist of pinhead- to pea-sized vesicles, or small, acuminate papules which later undergo vesiculation, and are usually confined to the cheeks, nose, ears, and backs of the hands.

In a case observed by Hyde, a new crop of vesicles and bullae on the face was accompanied at times by an herpetic keratitis, but this complication is an unusual one. There may be some accompanying itching and burning, but as a rule subjective symptoms are slight or en-

Fig. 723.—Hydroa vacciniforme.

Fig. 724.—Hydroa vacciniforme.

tirely wanting. The duration of an individual vesicle is from three to seven days. At the end of that time, the lesion, which often exhibits more or less umbilication, becomes inspissated, and a yellowish or reddish crust forms, which soon drops off, leaving a sharply

Fig. 725.—Hydroa vacciniforme. (Courtesy of Dr. Phillip Shaffner.)

Fig. 726.—Hydroa vacciniforme.

defined, pit-like cicatrix. By the development of new lesions an attack may be prolonged for several days, although the average exacerbation seldom extends over a fortnight. In White's case the

Fig. 727.—Hydroa vacciniforme. Low magnification.

scarring was extensive, and there was much resultant disfigurement on the fingers and ears.

Hydroa puerorum.—This affection was originally described by Unna, and has been exhaustively investigated by Haase and Hirschler.

It resembles hydroa vacciniforme in many respects. Bleb formation, usually as a result of vesicle coalescence, is more common, however, and the eruption is not confined to the exposed surfaces. Scarring is of far less frequent occurrence than in hydroa vacciniforme.

Etiology and Pathology.—The essential cause of the malady is unknown, although exposure to the sun and the wind is a strong contributory factor. Ehrmann believes the skin lesions to be of actinic origin. If Ehrmann's supposition is correct, it appears remarkable that the disorder should be practically confined to members of the male sex. Histologically, the papillae are swollen, and there is dilatation of the intrapapillary vessels. The prickle layer, which is the seat of the vesicle formation, is thickened and edematous at first, and later the seat of a sharply circumscribed, necrotic process which frequently extends downward far into the derma.

Diagnosis.—The character and distribution of the lesions, their occurrence in summer, and the fact that the vast majority of the cases occur in young males should serve to exclude erythema multiforme, pemphigus, and dermatitis herpetiformis, the only disorders with which the disease is likely to be confused.

Prognosis.—The severity of the attacks can be mitigated by treatment, but the disease seldom disappears before the patient reaches adult age.

Treatment.—Protection from sunlight and from hot winds is an important preventive measure. Of the various local medicaments, calamine lotion, alone or alternated with a soothing, oily protective, such as zinc oil, is one of the best.

ORIENTAL SORE.

Synonyms.—Biskra button; Oriental boil; Delhi boil; Delhi sore; Aleppo boil.

Definition.—A specific, ulcerative, cutaneous disorder which usually develops on the face or other exposed part of the body as a result of infection with a protozoön, the Leishmania tropica (Wright).

Symptoms.—Following inoculation, there is an incubation period of from two weeks to five months. At the end of this period the lesion manifests itself as one or more small, itchy, indurated, red papules. If the primary sore consists of two or more lesions, coalescence usually occurs early, with the formation of a single nodular mass. As a rule, the growth gradually increases in size until it has attained the diameter of a small pea, when it tends to undergo sur-

face necrosis, with the formation of a yellowish, or brownish, crust. When this disintegrated material is removed, a sharply defined, superficial ulcer is exposed. Subsequently, the lesion may undergo gradual involution without marked inflammatory manifestations, or furunculoid or carbunculoid symptoms may supervene, to be followed by ulceration of variable extent. Ultimately, however, in the course of several weeks or months, healing takes place, with more or less resultant scarring. As a rule, only one sore is present, although instances of multiple infection have been reported. The lesions vary in diameter from 3 to 10 centimeters, and are usually located on the face or ears, although the hands, the dorsal surface of the feet, and the arms and legs occasionally are attacked. When located near the mouth, the contiguous mucous membrane may be involved. Constitutional symptoms are usually absent, although there

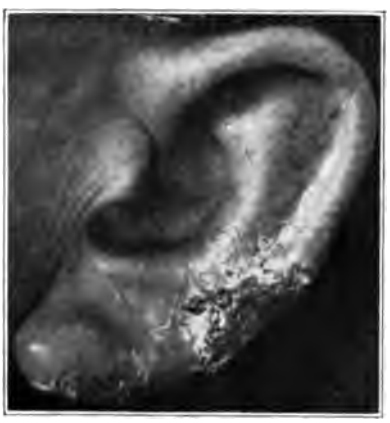

Fig. 728.—Oriental sore. (Courtesy of Dr. Ernest L. McEwen.)

may be slight elevation of temperature during the period of incubation.

Etiology and Pathology.—The disorder is due to inoculation with a protozoön, the Leishmania tropica, and it is probable that in the majority of instances the infection is insect borne (mosquitoes, fleas, flies, and ticks). Cases have also been reported in which the disease had apparently been contracted through the medium of contaminated laundry and other clothing. Both sexes are attacked impartially, and no age is exempt. In addition to the protozoön (which is morphologically indistinguishable from the Leishman-Donovan bodies found in Kala-azar), Unna, Wright, Herzog and others have described the

occurrence in the lesions of numerous biscuit-shaped, Gram-positive diplococci. Histologically, the principal changes are to be found in the corium, the epidermal involvement being mainly secondary. The corium is densely infiltrated with plasma cells, lymphoid cells, and

Fig. 729.—Leishman bodies from a case of Oriental sore. (Courtesy of Dr. Ernest L. McEwen.)

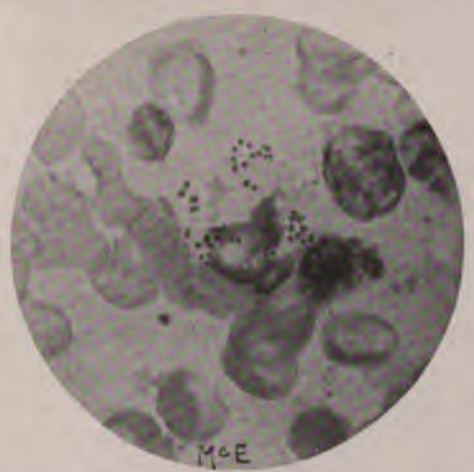

Fig. 730.—Gram-positive diplococci, free and intracellular, found in smears from a case of Oriental sore. (Courtesy of Dr. Ernest L. McEwen.)

round cells, together with an occasional giant cell. Elliot found no evidence of the disease beginning in the glandular structures, although the coil glands exhibited evidence of round-cell infiltration in case examined by Darling.

Diagnosis.—The disease is liable to be confused with syphilis, yaws, lupus vulgaris, and the common staphylococcic affections. The occurrence of the lesion in endemic districts, its peculiar symptomatology and course, its local character, and, in obscure cases, the demonstration of the causative organism, should serve for differentiation.

Prognosis and Treatment.—The malady is self-limited, although its duration in many instances can be shortened by appropriate medication. Adams speaks highly of thorough refrigeration with carbon dioxide snow. Others recommend excision, the use of the actual cautery, the hot water spray, or the application of tincture of iodine, solutions of bichloride (1 to 1000), ammoniated mercury or europhen ointment, and similar antiseptics. Of the various internal remedies, quinine and arsenic probably share first place (Stelwagon). Arsphenamine has been employed without ensuing benefit.

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VERRUGA PERUANA.

Synonyms.—Peruvian warts; Oroya fever; Carrion's disease.

Definition.—An infectious, constitutional disorder, endemic over certain inland portions of Peru, and characterized by fever of an intermittent, remittent or irregular type, followed or accompanied by a rapid and progressive anemia, and a cutaneous eruption of pin-head- to pea-sized, warty growths.

Symptoms.—The period of incubation varies from two to six weeks or longer, and is characterized by fever of an irregular type, joint-pains, head- and back-ache, and anemia of a severe grade. On the appearance of the eruption these symptoms gradually subside, and may disappear altogether. The earliest cutaneous manifestations may be of a mixed erythematous and vesicular type, but are usually purely erythematous. The distribution is roughly symmetric, and more or less general, although the face, neck, and extensor surfaces of the arms and legs are the sites of predilection. The mucous membranes are early involved. In the course of a few hours or days, groups of papules, many of which later become nodules, develop on

the erythematous spots. These lesions are of variable size (from .5 to 2.0 centimeters in diameter), bright or dark red in color, and very sensitive to touch. In form they may be sessile, cylindrical, or pedunculated. The enveloping capsule is thin and fragile, and frequently ruptures, giving rise to hemorrhages which tend further to debilitate the already weakened patient. In addition to the surface lesions, nodular, subcutaneous masses frequently develop, particularly in the region of the joints, and, in the course of time, many of these break down, to form deep, foul ulcers which frequently give rise to more or less hemorrhage. A few of the superficial, warty growths may shrivel up and disappear, and many of the larger ones undergo absorption, but the attack may be prolonged over a period of many months by the development of new groups or crops of lesions, each outbreak usually being preceded by a recrudescence of fever and anemia.

Etiology.—The exciting cause of the disorder is not known. Barton's bacillus, which is found in the local lesions, as well as in the red blood cells during the febrile period of the disease, and which in many respects corresponds to the parathyroid bacillus, type "B," requires further study. Inasmuch as somewhat similar organisms have been described by Izquerdo, Nicolle, Giltuen, Letulle, de Vecchi and others, however, it is probable that the isolation and incompatible proof of the identity of the causative agents is only a matter of time. Cole successfully inoculated apes with the malady, and even succeeded in transferring the virus to the third generation, but unfortunately, none of the organisms that had been mentioned as specific were found. Histologically, the tumors from both the human subject and the apes resembled each other very closely in the gross and in their structure and mode of formation. Cole concludes that "the tumors are granulomatous in type, and are caused by some unknown organism, probably circulating in the blood and causing an inflammation and obstruction of the lymph channels, along with subacute inflammatory changes and necrosis. As the other granulomata—tuberculosis, syphilis, sporotrichosis, and actinomycosis have their own significant histological changes, so also does verruga peruana, belonging to the same class, have its own characteristic microscopical picture. It is characterized by the dilatation of the lymph vessels and a choking of their lumina with mono- and polymorphonuclear leucocytes; also by an infiltration around these vessels of plasma cells, fibroblasts, mononuclear leucocytes and relatively small num-

bers of polymorphonuclear leucocytes. It is further characterized by the formation and dilatation of a great number of blood capillaries and by an extravasation of much serum and many red blood cells into the tissues. The lymph vessels either rupture at an early stage or dilate to large dimensions when their cellular contents undergo a pycnotic degeneration and hyaline change, with destruction of the vessel and invasion of the mass by plasma cells and fibroblasts."

Diagnosis.—The constitutional symptoms are suggestive, but not pathognomonic, even though the patient has been exposed to the disease. Consequently the diagnosis is dependent upon the recognition of the eruption. From frambesia it may be distinguished by the severity of the constitutional symptoms, as well as the character of the skin lesions.

Prognosis.—The average mortality is about 15 per cent. The duration of the disease is variable. In sluggish cases the process may drag on for months, and the patient finally recover, while in those instances in which there is hyperpyrexia, a severe grade of anemia, and great prostration, death may occur within a few days. In the case of the young medical student, Daniel Carrion, who contracted the disease by experimental inoculation, the period of incubation was 39 days, and the fatal termination 15 days later.

Treatment.—Change of climate, and particularly removal to the seashore often proves beneficial. The local treatment is largely symptomatic. Of the various internal remedies, arsphenamine is by far the most valuable, and is considered a specific by Castellani and other competent observers.

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ULCERATING GRANULOMA OF THE PUDENDA.

Synonyms.—Granuloma inguinale tropicum; Groin ulceration.

This disorder, which was first accurately described by Conyers and Daniels in 1896, occurs chiefly in young negro women, and is characterized by gradual, but progressive, superficial, serpiginous ulcera-

PLATE IX.

Ulcerating Granuloma of the Pudenda. Section from the advancing margin of lesion. (Courtesy of the British Guiana Medical Annual.)

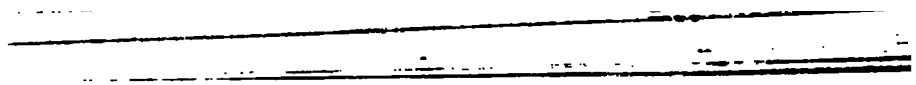

Fig. 731.—Lesions on the cheek in a case of granuloma inguinale tropicum. (Courtesy of Dr. Frederick G. Harris.)

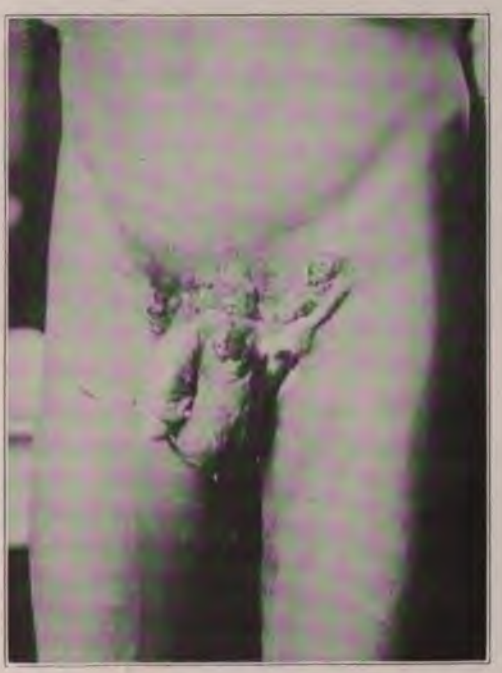

Fig. 732.—Granuloma inguinale tropicum. (Courtesy of Dr. Frederick G. Harris.)

tion of the tissues in the genito-crural and genito-anal regions. The majority of the reported instances have occurred in British Guiana, the Fiji Islands, and other tropical countries. The earlier lesions are papular or nodular in character, and are accompanied by marked edema and thickening of the skin in the affected area. In the course of a few weeks or months ulceration occurs, and progresses steadily, both by peripheral extension and by the development of satellite lesions. The ulcers are superficial, with somewhat raised,

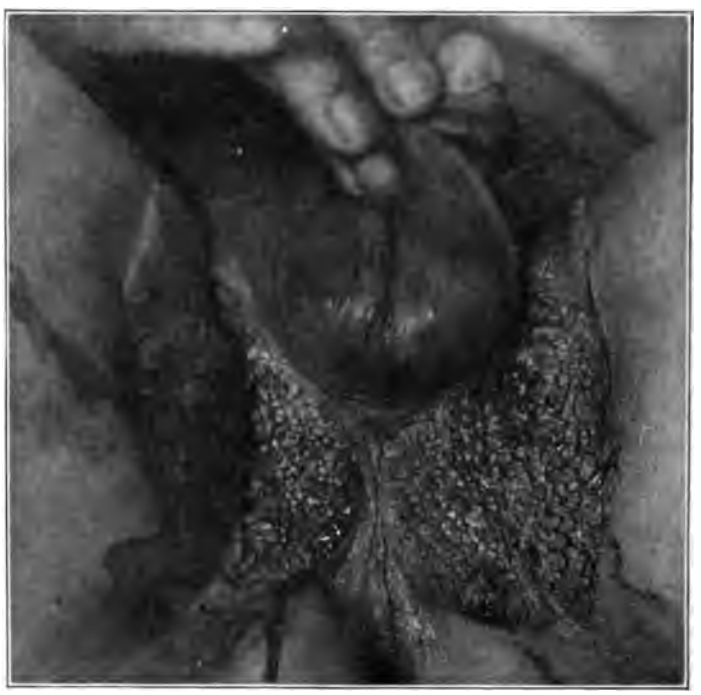

Fig. 733. Granuloma inguinale. (Courtesy of Dr. O. Singleton.)

nodular, irregular borders, and give rise to very little pain or discomfort. There is seldom associated lymphnode involvement.

Etiology and Pathology.—The majority of the victims are young women, although males occasionally are attacked. The disease is infectious, but the causative agent is not known. Various organisms have been recovered from the lesions, but none has been found to be pathognomonic. Histologically, Galloway found the papillae swollen and densely infiltrated with leucocytes and plasma and mast cells. The vessels were dilated, and the epidermis edematous, but stretched

and thinned. Walker recovered Donovan's organism (an intracellular capsule bacillus of the B. mucosus capsulatus group) from a typical case, and concludes that the disorder is a secondary infection with the capsule bacillus of lesions of venereal or other origin. Pardo likewise found Donovan's microörganism in one of his cases.

Diagnosis.—The disorder is to be differentiated from syphilis, and from the ulcerative processes which sometimes occur as sequelae of gonorrheal and chancroidal bubo. The slow but progressive character of the lesions, the absence of a positive serum reaction, and the lack of lymphnode involvement should serve to prevent confusion.

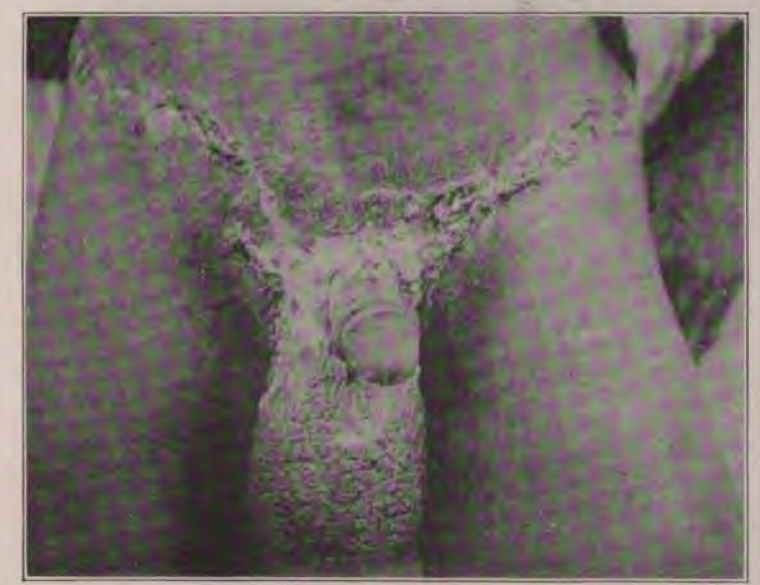

Fig. 734.—Granuloma inguinale tropicum. (Conyers and Daniels, courtesy of the New Guiana Medical Annual.)

Prognosis and Treatment.—The affection is an obstinate one, rebellious to treatment, and prone to relapses and recurrences. The x-rays have proved curative in a few instances. The results of antisyphilitic medication (arsphenamine, mercury, and the iodides) have proved disappointing. Cauterization, or curettage, with subsequent cauterization, and the application of moist antiseptic dressings, sometimes prove curative. Conyers and Daniels successfully employed salicylic acid (15 per cent) in creosote ointment, but both these authorities and Manson recommend excision of the diseased tissue and

the underlying scar. Aragao and Pardo report excellent results following the intravenous injection of 5 c.c. of a 1 per cent aqueous solution of potassium and antimonium sulphate every second day.

Fig. 735.—Ulcerating granuloma of the pudenda. (Conyers and Daniels, courtesy of the New Guiana Medical Annual.)

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BARCOO ROT.

Barcoo rot is a chronic inflammatory disease of the skin characterized by the occurrence of dime-sized, or larger, blebs and pustules on the hands, forearms, feet, and shins. When the lesions are ruptured,

the abraded surface forming the base shows little tendency to heal, but slowly extends at the margin and remains a superficial ulcer. The hair follicles are involved, and when the lesion finally heals, its former site is marked by an area of glassy skin, denuded of hair. The ulceration is met with in soldiers and bushmen in some parts of Australia, and cases have developed in the desert east of the Suez Canal. Hill believes that the one condition necessary to its development is long continued residence in a warm climate with scanty rainfall, together with much exposure to sun. He found that the use of internal tonics, such as the compound syrup of hypophosphites, invariably brought about a cure. Change of climate, likewise, is beneficial. Martin thinks that the disease progresses through the successive invasion of neighboring hair follicles; and has had good results following the extraction of the affected hairs, with their adherent root sheaths.

Veld Sore is a tropical disorder which in many respects resembles Barcoo rot.

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CHANCROID.

Synonyms.—Soft chancre; Ulcus Molle.

Definition.—A pinhead- to finger-nail-sized or larger, autoinoculable ulcer, of relatively benign character, occurring about the genitals, and due to inoculation with a specific micro-organism (Unna-Ducrey bacillus).

Symptoms.—The earliest manifestation is a minute, reddish macule, which appears at the site of inoculation in from twelve to twenty-four hours after exposure. This is quickly followed by an inflammatory papule, which is converted into a pustule in the course of from twenty-four to forty-eight hours, and ruptures, with the formation of a small, circumscribed ulcer, in another correspondingly brief period of time. The ulcerative lesions are usually single, although they may be multiple, and are of variable size and shape. As a rule they are circular or oval in outline, with soft, slightly indurated edges, and grayish, granular floors, bathed in pus. A reddened, inflammatory areola is usually present, although there is commonly but little, if any, induration. The lesions are both inoculable and autoinoculable, and spread both by peripheral extension and by the coalescence of adjacent ulcers. The period of incubation is com-

paratively short, from a few hours to four or five days, and the duration rather indefinite, from ten days to several months. There is usually associated involvement of the inguinal lymphnodes, and one or more of these structures may undergo suppuration and necrosis. The involvement may be unilateral or bilateral, and is usually accompanied by pain and fever. While confined to the genital region in the majority of instances, other localities may be attacked, usually as a result of autoinoculation.

Etiology.—The exciting cause is a bacillus, which is non-motile, does not stain readily with Gram's, and often forms chains. The organism can be grown upon blood-agar or blood, and Tomasczenski has demonstrated that typical lesions can be reproduced by inoculation. It has recently been demonstrated that the bacillus of chancroid

Fig. 736.—Chancroid of penis.

sometimes exists in the female genital tract as a saprophyte, but when transplanted on other tissue may become pathogenic.

Diagnosis.—Chancroid is to be differentiated from chancre, mucous patches, herpes, and epithelioma.

In chancre the period of incubation is long, from two to six weeks; the lesion is painless, ulceration is infrequent, lymphnode involvement is bilateral, symmetric, and of characteristic type (the nodes being hard, nut-like, painless and freely movable), and the spirocheta pallida can usually be found in the lesion (by dark background illumination or by the India ink method).

In infections of a mixed character (due to the conjoint presence of the organisms of syphilis and chancroid), the diagnosis is more

difficult, and it is seldom if ever possible to exclude lues. Consequently, a patient who is suffering from chancroid should always be informed that the lesion may be of the mixed type, and that a diagnosis of syphilis can be excluded only by time and the non-appearance of other clinical or biological manifestations of the disease. Mucus patches of the genitalia are always accompanied by symptoms of syphilis elsewhere on the body. This fact, together with the superficial character of the lesions, and the history, should serve for differentiation, or should at least arouse suspicion. Epitheliomata usually develop after the fourth decade of life, chancroids before that period. In epitheliomata there is often a history of long continued irritation, and the lesions develop slowly, and are always nodular and indurated. In doubtful cases, recourse should be had to a biopsy.

Prognosis.—As a rule, chancroids heal readily in the course of a few days or weeks under ordinary hygienic measures. In debilitated subjects, however, and occasionally for no apparent reason, unless it be an extremely virulent grade of infection, ulceration is extensive, and the resulting destruction great.

Treatment.—Cleanliness is the first requisite. The parts should be carefully and thoroughly cleansed once or twice daily. Unnecessary exercise should be avoided. Alcohol and other stimulants are extremely harmful. Should there be a complicating phimosis, mild astringent applications, such as lead and opium lotion, or aqueous solutions of aluminum acetate, may be employed for a time until the inflammation subsides. As soon as the ulcer can be exposed, it should be thoroughly cauterized, under novocain anesthesia, with pure nitric acid. Afterward the acid may be neutralized with powdered sodium bicarbonate, and a moist antiseptic pack (1 per cent lysol) applied for forty-eight hours. An antiseptic dusting powder, such as dithymol diiodide, may then be substituted. Pendergrast has recently reported admirable results from the application of argyrol crystals, a remedy which he considers specific. Bansbach speaks highly of a mixture of calomel, 10 grams, zinc sulphate, 10 grams, aquae chlorine, 50 c.c. This solution is applied for twenty-four hours, on a pledget of cotton, when the chancroidal ulcer is completely destroyed. Goubeau recommends thorough cleansing of the lesion by means of cotton swabs soaked in ether, when the following solution is applied:

Sodium arsenate	1.
Alcohol, 95 per cent	50.

The alcohol is evaporated by a current of air, leaving a fine film of

arsenate on the surface of the lesion. The application is repeated daily for four or five days. Robbins and Seabury apply a 25 per cent aqueous solution of copper sulphate to the sore and follow this with a short high frequency spark from a fine-pointed vacuum electrode. Later, the entire mucous surface of the preputial cavity is covered with an antiseptic dusting powder.

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GANGRENOUS BALANITIS.

Synonyms.—Balano-posthomykosis; Balano-posthite erosive circinee; Fourth venereal disease.

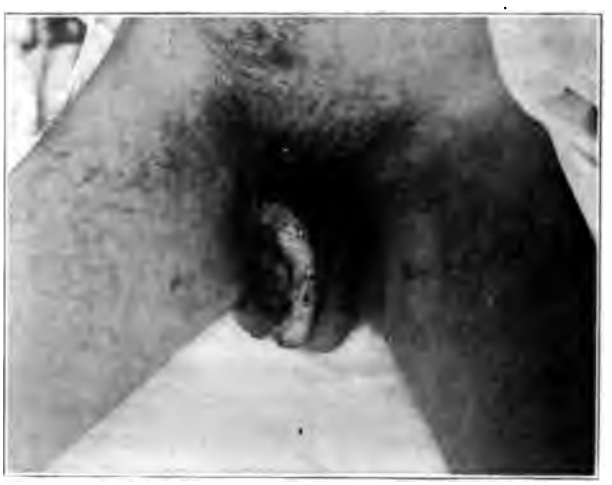

Fig. 737.—Gangrenous balanitis.

Bataille and Berdal in France, Scherber and Muller in Austria, and Corbus and Frederick Harris in this country have called attention to an erosive and gangrenous type of balano-posthitis which develops rapidly, and under favorable conditions may give rise to deep and widespread gangrene. The causative organism is very probably a

vibrio, although there is constantly present also a Gram-negative spirochete. The prompt and liberal use of hydrogen peroxide is followed by recovery in many instances, but the remedy must be applied early, before the organisms have invaded the deeper layers, in order to bring about a cure. In advanced cases, the treatment is surgical, al-

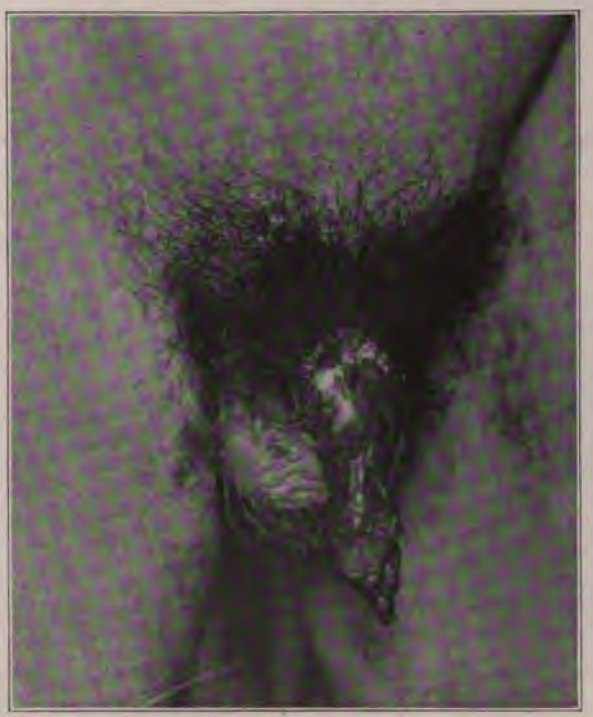

Fig. 738.—Erosive gangrenous balanitis, gangrenous stage. (Courtesy of Dr. Frederick G. Harris.)

though hydrogen peroxide and potassium permanganate irrigations are helpful here also. I have found the injection of oxygen gas, directly into the tissues, through a hypodermic needle connected to the tank by means of a rubber tube, curative in one advanced case of the disease.

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CLASS IX.—DISEASES OF THE APPENDAGES.

1. DISEASES OF THE HAIR AND HAIR FOLLICLES.

HYPERTRICHOSIS.

Synonyms.—Superfluous hair; Hirsuties; Hypertrophy of the hair; Hairiness; Polytrichia.

Definition.—Excessive or abnormal hairiness from any cause.

Symptoms.—Hypertrichosis may be congenital or acquired, and of limited or universal distribution. Congenital hypertrichosis of a generalized type is extremely rare. Instances of localized heavy

Fig. 739.—Excessive hairy growth in a girl age seven years. Both arms were affected.

growth, particularly in pigmented areas on the lower trunk, buttocks, and thighs are not very uncommon, however, and are classified with the nævi. In the universal cases the increased general hairiness may be present at birth (as in the case of the Russian "dog-faced man"), or may develop during childhood. In a case under my own observation the growth first became markedly noticeable during the patient's sixth year. The hairs were soft and downy, and of a light-yellow color. The entire surface, with the exception of the palms and soles, was affected, although the face and the forearms appeared to be the sites of predilection. On the forearms the hairs were closely set, and averaged 5 cm. or more in length. There was no hereditary history, as in Beigel's and in other cases that have been reported. Weber has recently described a case similar to the one here reported.

Acquired hypertrichosis is a comparatively common disorder. It is usually partial, although a few universal examples have been recorded (by Zarubin and others). The areas commonly affected are the cheeks, chin, and the upper lip, and, occasionally, the forearms and the legs. In rare instances certain of the follicles, usually those of the bearded region, are found to contain two, or even three or more hairs. Occasionally hairs deviate from their normal course, and in certain localities, as at the margins of the lids (when the condition is known as "trichiasis"), the deformity may give rise to more or less discomfort or even injury. Another disorder which sometimes occurs in this region is known as "districhiasis," and is characterized by the presence of a double row of lashes, one of which curves outward, in a normal manner, the other inward, to impinge on the eye ball.

Etiology.—In a small percentage of cases, irritation, with ensuing hyperemia, probably plays some part in the causation of hirsuties. Family and racial peculiarities likewise are important factors in some instances, but of the essential cause of hypertrichosis we are compelled to acknowledge that we know practically nothing. There is a popular impression among women that the frequent application of vaseline, grease, and oils on the face will give rise to excessive hairiness, but I must agree with Pusey that it is extremely doubtful if it ever does. Deficiencies and alterations in the secretions of certain of the ductless glands possibly play an important part in many of the acquired cases, and utero-ovarian disturbance is apparently a factor in others (E. Wilson; Gottheil; McAuliff). At the present time, however, our knowledge of hormones and of similar bodies is mainly theoretical. Consequently, therapy based on this knowledge is largely a matter of guess-work.

Prognosis.—General hypertrichosis, whether congenital or acquired, is irremediable. In localized cases, if not too extensive, the disfigurement can be greatly alleviated by treatment, but the process is a tedious and painstaking one, and oftentimes taxes the patience of both operator and patient to the utmost.

Treatment.—Only two practical methods for the permanent destruction of superfluous hairs are known, *electrolysis* and the *x-rays*. Of these, electrolysis is by far the safer and more practicable, and will be described first. The procedure was first described by Michel, of St. Louis, who successfully employed it for the removal of the inturning lashes in trichiasis. Later, Hardaway, G. H. Fox, Brocq, Stelwagon, Baum and others reported encouraging results following its use, and the procedure has since met with universal approval. When

properly carried out, the resultant scarring is very slight, and the results permanent. Success is dependent upon the destruction of the papilla and lower part of the follicle, and for this reason great care must be exercised to insert the needle in such a manner that the tip lies in close contact with the offending papilla. A direct current (from batteries or from an electric main), of from 1 to 3 milliamperes, and a rheostat for regulating the flow of current are required. In addition, a milliamperemeter, cords, and a hard-rubber needle holder are essential. The needles may be of steel or iridoplatinum, and should be long, and extremely slender. The type suggested by Baum is an admirable one. The holder, with the needle, is attached to the negative pole. A soft, well-moistened sponge is usually attached to

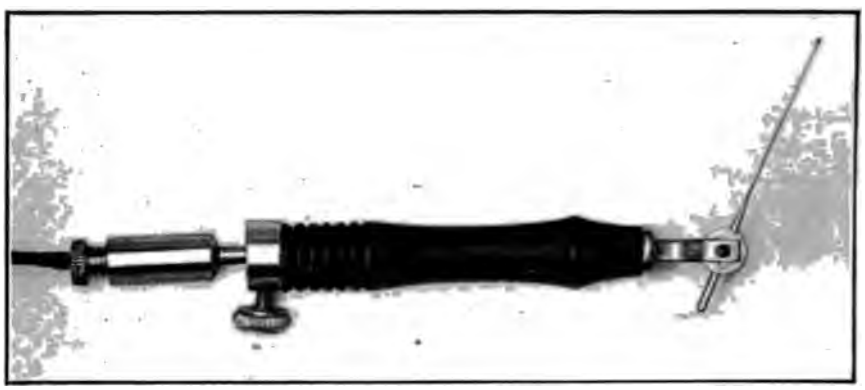

Fig. 740.—Baum's needle for the removal of superfluous hair. (Courtesy of Dr. H. C. Baum.)

the positive terminal, although some operators prefer that this pole be immersed in a glass of water, wherein the patient may thrust her fingers or hand when closing the circuit. The needle holder is lightly grasped, like a penholder, in the operator's working hand, and the tip of the needle is gently inserted into the mouth of the follicle containing the offending hair. Very little force is required. As a rule the needle slips easily downward to the bottom of the sac. The circuit is then closed for a few seconds, or until bubbles of gas appear at the follicular orifice, and the needle is then withdrawn. If the procedure is successful, the hair can be readily and painlessly extracted. If the shaft refuses to come away easily, it should be left in place for a few days, or until the inflammatory reaction has subsided, when treatment may again be instituted. Two or more adjacent hairs should never be removed at the same sitting because

of the danger of resultant scarring. Baum recommends that the offending shafts first be extracted, when the papillae can readily be reached through the follicular orifice, without pain or discomfort to the patient. As a preliminary measure, the affected area may be cleansed with benzine, or with alcohol, and following the operation frequent bathing with hot water or with alcohol will hasten the subsidence of the reaction. In the hands of a skilled operator, the percentage of recurrences by this method is comparatively slight (about 1 in 10), and the patient experiences but little discomfort. In order to lessen the pain, cocaine or novocain can be applied to the follicles in the affected area by means of the positive electrode, but harmful effects may ensue as the result of an overdose, and in my hands the method has proved unsatisfactory. A better plan, when dealing with nervous individuals, is to prescribe moderately large doses of sodium bromide, to be taken for a day or so preceding the operation. This drug calms the patient and also lessens the cutaneous sensibility, and is harmless.

The eradication of superfluous hair by means of the *x-rays* is dependent upon the follicular atrophy which usually follows the application of a single or divided erythema dose of this agent. The method was first suggested by Freund, of Vienna, and has been successfully employed by Pusey, MacKee, Geyser, and others in this country. Great care must be exercised, however, in order to avoid Röntgen-dermatitis, and, in addition, there is always present the danger of subsequent atrophy of the skin, with more or less permanent disfigurement. As Pusey states, "The results are so uncertain, and the possibilities of harm so great, that treatment by this method should not be undertaken except in extreme cases, or with the full understanding that if the exposures are to be kept in the bounds of safety, improvement is altogether uncertain." Temporary relief from hypertrichosis can be obtained by shaving, or by the use of depilatories, such as barium sulphide. Gentle rubbing with pumice stone was found helpful by Stelwagon, and more recently by Schwenter-Trachsler. The frequent application of a fresh solution of hydrogen peroxide tends to both bleach the offending hairs and retard their growth (Bulkley). All of the adherent oil should first be removed with ammonia water or alcohol, and the agent then applied several times daily. In the various chemical depilatories that have been suggested, the nature of the active ingredient differs considerably. Barium sulphide, calcium sulphohydrate, calcium, or a mixture of calcium and sodium hyposulphite can be employed. One of the best

formulas is that of Duhring. It consists of from 2 to 4 drams (8.0-16.0) of fresh barium sulphide, with enough zinc oxide and starch, in equal parts, to make an ounce. Sufficient water is added to make a paste, and this is spread thickly on the affected area, and allowed to remain for a few minutes, or until the offending filaments are dissolved. The paste is then removed, the part cleansed, and a coating of cold cream applied. McEwen has found heredity the most frequent factor. Disturbances of the ductless glands undoubtedly have some influence.

PLICA.

Synonyms.—Plica polonica; Polish plait.

Plica is a peculiar, matted condition of the scalp hair which occurs as a result of filth and neglect. The felted mass is usually moist, as a result of eczematous oozing, and generally contains large numbers of parasites, especially pediculi. While more common in Poland and Alaska than elsewhere, instances are occasionally observed in other countries.

PLICA NEUROPATHICA.

Plica neuropathica is a term applied to an idiopathic matted or felted condition of the scalp hair of unknown origin. Cases have been described by Stelwagon, Ohmann-Dumesnil, and others. The disorder usually develops slowly, and may involve the hair in only a small area. In Stelwagon's patient "the felting was limited to a dollar-sized area posteriorly just below the occipital protuberance, and had been a growth of years, forming a round, matted, felted lock, 4 feet long." None of the reported instances exhibited the presence of pediculi, or of exudative disorders of the scalp. It is possible that the twisting and tangling are a result of some peculiar change in the shape of the affected hairs, or, as J. C. White has suggested, they may be due to some peculiar arrangement of the cortical cells, similar to those of the hair of animals in which natural felting occurs.

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ATROPHIA PILORUM PROPRIA.

Synonym.—Atrophy of the hair.

Atrophy of the hair may be either symptomatic or idiopathic. Symptomatic atrophy is generally due to severe constitutional disorders, as syphilis, tuberculosis, and diabetes, although it may occur as a result of some local infective malady, as ringworm or seborrheic dermatitis. It is characterized by dryness, splitting, and curling of the affected shafts, with loss of flexibility. In the idiopathic form the changes occur without known or apparent cause.

Fragilitas Crinium.—Fragility of the hair may manifest itself by splitting or by breaking of the shaft. Splitting may occur at either extremity, or at some intervening point, and a few, or a very large, number of filaments may be involved. Duhring, Parker, and Hyde refer to cases in which fission took place within the follicle, with more or less ensuing irritation of the walls of the sac. In those instances in which brittleness is the predominant feature, the hairs break off from handling. Aside from the fact that atrophy of the bulb is sometimes present (Duhring), nothing is known of the essential cause of the condition.

Fig. 741.—Trichorrhexis nodosa. Low magnification. (Courtesy of Dr. E. Wood Ruggles.)

Treatment.—The scalp should be kept clean, and an occasional coat of an oily dressing (vaseline) applied. In splitting of the distal extremities of the shafts, clipping off the split ends may retard the process. Singeing is harmful, and should never be resorted to.

Trichorrhexis Nodosa (Trichoclasia; Clastothrix; Nodositas Crinium).—This disorder, which was probably first described by Beigel, in 1855, is characterized by a peculiar nodose condition of the hair, directly due to longitudinal splitting of the shaft for a comparatively short distance, the resulting formation resembling two small, round brushes pressed end to end. There may be accompanying complete or incomplete transverse fracture of the shaft. Several or more nodes may develop in a single filament. In men the moustache and the beard are the most frequent seats of the disease (Hodara), and in women the hairs of the scalp and those of the labia ma-

jora (Raymond). The hair of the pubes and axillae occasionally are involved. The nodes are grayish in color, and of minute size, and their presence can often be detected only by careful search. The roots apparently are not affected, consequently the disease gives rise to very little actual hair loss.

Etiology and Pathology.—Heidingsfeld, to whom we are indebted for one of the most exhaustive studies on the subject, concludes that "Trichorrhexis is both a normal and a pathological process. It is universally present in long uncut hair as a normal condition and is probably nature's method of physiologically arresting and stunting an otherwise unlimited and eventually cumbersome overgrowth of hair. When present to excess in a predisposed individual, it becomes a pathological process and abnormally stunts the growth of the hair; the nodes are more prominently wounded and are often multiple, separated from each other by uniform intervals of normal hair shaft. Its etiology has been variously attributed to trophic, parasitic and mechanical influences. A mechanical causation is improbable on purely clinical grounds, and is incapable of artificial demonstration. The condition in brushes can likewise not be attributed to purely mechanical causes. A parasitic causation is not commensurate with the evidence thus far adduced from clinical studies and bacteriological investigations. The most rational explanation of its etiology from physical, bacteriological and clinical investigation, and its analogy to kindred and associated changes in the hair rests in trophic influences, emanating from the metabolism at large, and permeating the hair to its ultimate extent."

Prognosis.—The disorder is persistent, and rebellious to treatment. Epilation of the affected shafts, or frequent shaving, may do good. If the hair is dry and harsh, oils, as castor oil or vaseline, are indicated. Many authorities recommend the application of parasiticides, of which bichloride of mercury (1 to 2,000, in alcohol), with a small percentage (0.3 per cent) of castor-oil added, is one of the best.

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MONILETHRIX.

Synonyms.—Beaded hair; Moniliform hair; Pili annulati.

This affection is usually congenital, and frequently hereditary, and is characterized by fusiform swellings separated by constricted, atrophic portions, giving the affected filament a peculiar, beaded ap-

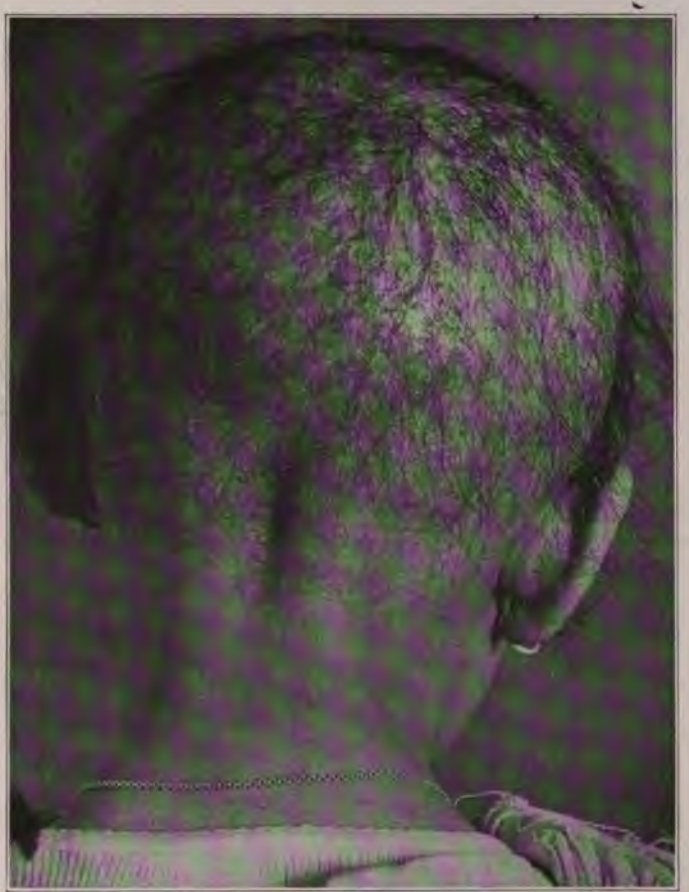

Fig. 742.—Monilethrix, showing characteristic loss of hair. (MacKee and Rosen's case. Courtesy of Dr. George M. MacKee.)

pearance. The shafts are very fragile, and break readily between the nodes, and extensive areas of alopecia are not uncommon. There is often an associated keratosis pilaris, and Brocq believes that an etiologic relationship exists between the two disorders. The nodular sections contain excessive amounts of pigment, and the constricted

portions very little. The entire shaft is generally affected. The disease is usually confined to the scalp hairs, although both Ruggles and Gilchrist have reported cases involving the legs.

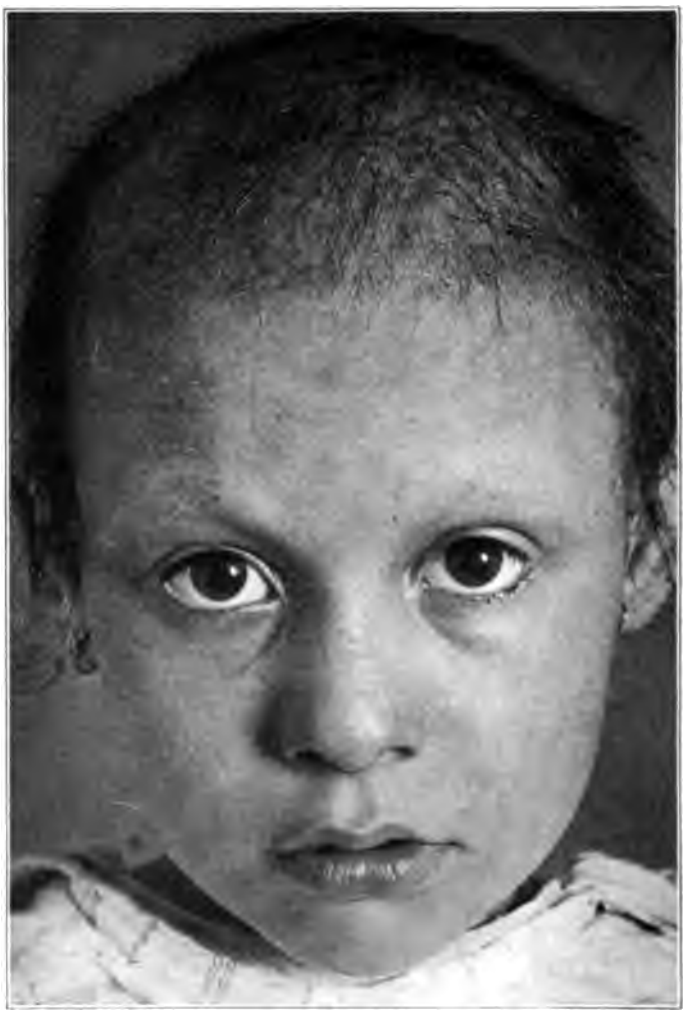

Fig. 743.—Monilethrix. (MacKee and Rosen's case. Courtesy of Dr. George M. MacKee.)

Etiology and Pathology.—Heredity is apparently an important factor in some instances. Children are usually attacked, although the disease occasionally begins in adult life. The exciting cause of the malady is not known. Virchow considered it a periodic aplasia

of the hair papillae. Unna concludes that nervous shock is a probable cause. Gilchrist believes the disorder to be a trophoneurosis. He found the epidermis between the hairs thinner than normal, and in

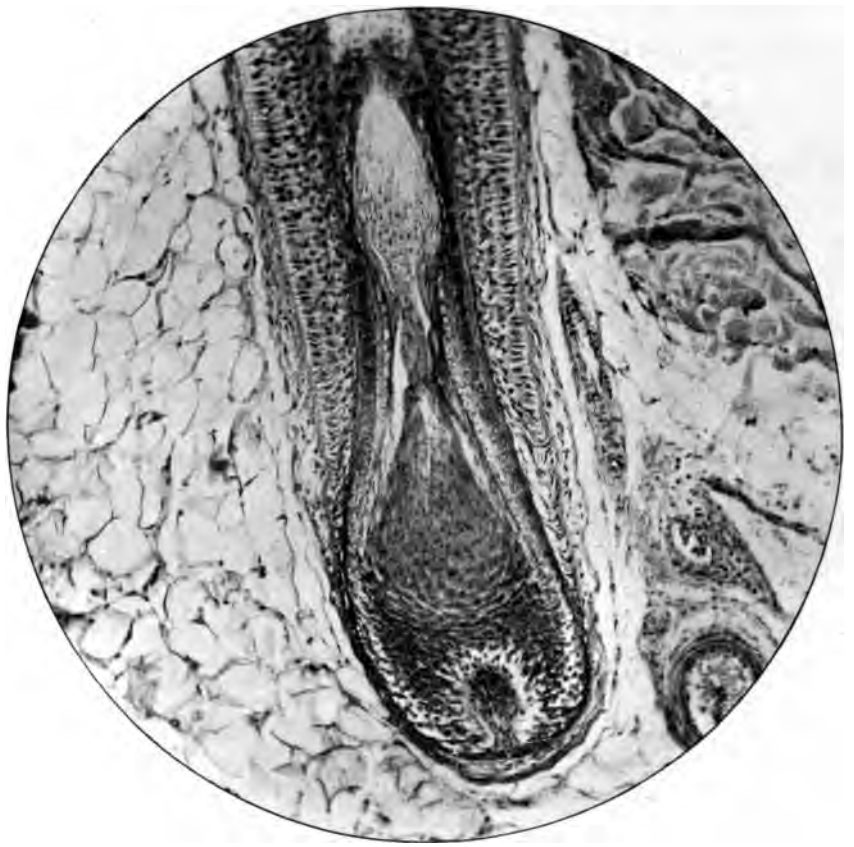

Fig. 744.—Monilethrix, showing trophic changes in follicle. Low magnification. (Courtesy of Dr. George M. MacKee.)

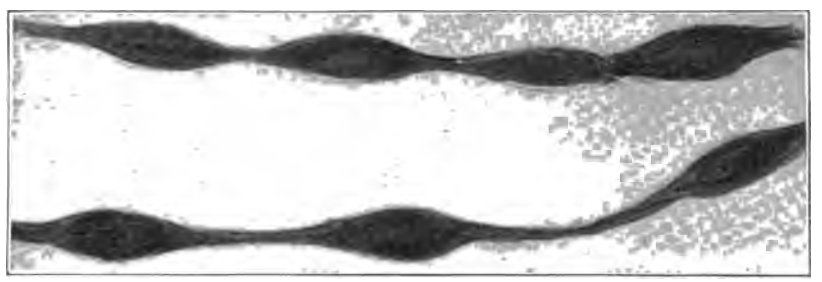

Fig. 745.—Monilethrix. Low magnification. (J. F. Payne.)

one follicle the mouth was almost blocked by a firm, dense, hyperkeratotic mass. The nodes and constrictures could be traced down to the lower fourth of the intrafollicular portion, and there were corresponding narrowings in the lumen of the follicle. In the vicinity of the follicles the capillaries exhibited perivascular inflammatory

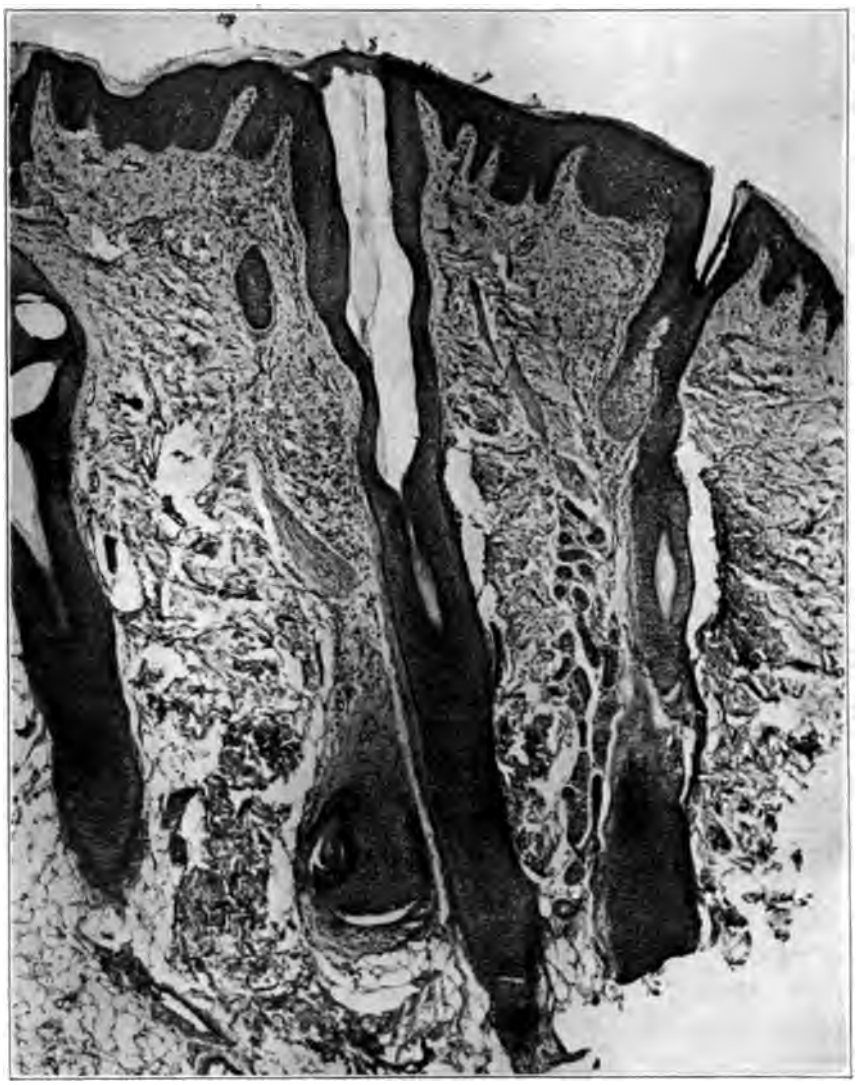

Fig. 746.—Monilethrix, showing characteristic changes in follicles. Low magnification. (Courtesy of Dr. George M. MacKee.)

changes (connective-tissue and lymphoid cells). The hair papillae, erector pili muscles, and coil glands were apparently normal. Bacteriological examinations were without result. MacKee and Rosen, who have recently made an exhaustive clinical and histological study of seven cases of the disorder, conclude that it is due to a congenital defect, and is associated with keratosis pilaris, an affection considered by many as being closely related to ichthyosis.

Prognosis and Treatment.—The disorder is not very amenable to treatment. Gilchrist's case recovered spontaneously. Keratolytics (particularly preparations containing salicylic acid), stimulants, and massage may be tried.

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MONILETHRIX.—*Gilchrist*, Jour. Cutan. Dis., 1897, p. 157. — *Ruggles*, Jour. Cutan. Dis., 1900, p. 500. — *Beatty and Scott*, Brit. Jour. Dermat., 1892, p. 171. — *Brocq*, La Pratique Dermatologie, i, p. 362. — *MacKee and Rosen*, Jour. Cutan. Dis., 1916, pp. 444 and 506 (with histology, valuable illustrations, and complete references to literature).

TRICHONODOSIS.

Synonym.—Pseudoknotting of the hair.

This curious condition was first described by Galewsky in 1906, and is characterized by pseudoknotting of the hair, often with associated fragilitis crinium. The scalp hair only is usually affected, although in one of Galewsky's cases the scalp, beard, pubes, and even the lanugo hairs on the trunk were involved. MacLeod has recorded the history of a case, occurring in a girl, in which true knotting of scalp hair occurred, and Kren, who has carefully investigated the subject, states that true hair knotting is not unusual, and that he found it in over 60 per cent of a series of 54 female patients who were suffering from skin diseases.

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TRICHONODOSIS.—*Galewsky*, Arch. f. Dermat. u. Syph., 1906, lxxxi, p. 195. — *Saalfeld*, Arch. f. Dermat. u. Syph., 1906, lxxxii, p. 245. — *MacLeod*, Brit. Jour. Dermat., 1910, p. 164; Idem, ibid., 1911, p. 111. — *Kren*, Wien. klin. Wchnschr., 1907, p. 916.

PIEDRA.

Synonym.—Trichosporosis nodosa.

Piedra is a disease of the hair occurring in certain districts in South America (principally Colombia), and is characterized by the development of several or more, dark, nodular, pinpoint- to pinhead-sized, gritty masses on the shafts of the hairs of the scalp, eyelashes, or beard. The nodes may entirely encircle the shaft, or they may be attached to it one side only. The involved filament is

usually dry, distorted, and twisted. When the hair is combed or shaken, a rattling noise is elicited.

Etiology and Pathology.—It is generally accepted that the concretions are due to a fungus growth (probably the Trichosporum giganteum), although Unna believes that several forms of fungi are usually present. It is probable that the mucilagenous oil commonly

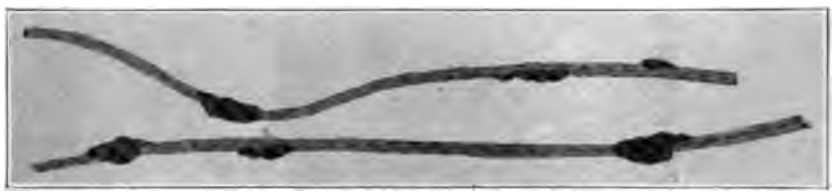

Fig. 747.—Piedra. Specimens taken from the scalp of an aboriginal Indian girl, of British Guiana. (Courtesy of Dr. J. M. H. MacLeod.)

Fig. 748.—Piedra. Low magnification. (Courtesy of Dr. J. M. H. MacLeod.)

used for dressing the hair serves as a culture medium for the organisms. Histologically, MacLeod found the nodules to be located entirely outside of the hair shaft at first, but later the underlying cuticle became dissolved or broken up, and the cortex was invaded. As a result the filament became twisted, and was easily fractured.

Treatment.—The scalp should be sponged with benzine, to remove

all of the particles, and then washed thoroughly with soap and water. Following this, a parasiticide, such as bichloride in alcohol (1 to 2,000), is to be employed daily for several weeks.

Chignon Disease.—Beigel has suggested this name for a condition which sometimes affects the hair on wigs and toupees, and which is characterized by the presence of small, brownish nodules, not unlike those found in piedra. It appears probable that this disorder also is due to a fungus.

Piedra Nostras (Tinea Nodosa).—This disease affects the moustache or beard, the hairs being ensheathed in a brownish concretion composed of masses of fungi. The disorder is usually confined to the outer extremity of the shaft. The affected portion of the hair is rendered brittle and inelastic, although the fungi do not appear to invade the cortex.

Treatment.—Crocker advises shaving or clipping, although it is probable that the treatment advised in piedra would prove effective in this disease also.

REFERENCES.

PIEDRA.—*Morris*, Tr. Path. Soc., London, 1879, xxx, p. 441. — *MacLeod*, Brit. Jour. Dermat., 1912, p. 132. — *Pernet*, Brit. Jour. Dermat., 1900, p. 141. — *Jackson and McMurtry*, Diseases of the Hair, New York, 1912. — *Behrend*, Berl. klin. Wchnschr., 1890, p. 464. — *Unna*, Histopathology. — *Moses*, Brazil Med., 1917, xxxi, p. 150 (interesting paper).

LEPOTHRIX.

Synonyms.—Trichomycosis palmellina; Trichomycosis nodosa.

This disorder, first described by Paxton[1], in 1869, is characterized by the occurrence of rough, nodular masses along the entire length of the affected hair. The axillary and pubic regions are the areas commonly involved, and the concretions, which are yellowish or reddish in color, are composed of masses and chains of elliptical micrococci, imbedded in a homogeneous, gluey, chitin-like substance. The concretions vary in size and shape, the most common form being irregularly nodular, and arranged laterally on the shaft. The cocci frequently invade the cortex, and lodge and multiply beneath the cells of the broken cuticle. The affected hairs become brittle, and fissuring and even fracture are not uncommon. A not infrequent complication is infection with a second micro-organism which gives the concretions, as well as the sweat with which they come in contact, a reddish tinge.

[1]*Paxton*, Jour. Cutan. Dis., London, 1869, p. 133. — *J. E. Lane*, Trans. Am. Dermat. Assn., 1919.

Treatment.—Removal of the sebum by means of deodorized benzine, to be followed by frequent applications of an alcoholic solution of bichloride of mercury (1 to 1,000), or of formalin (1 to 300) will frequently bring about a cure. Resorcin has been recommended, but may give rise to staining, and is less effective than the mercurial preparation.

Fig. 749.—Trichomycosis palmellina. Moderate magnification. (Courtesy of Dr. Frederick G. Harris.)

TRICHOSTASIS SPINULOSA.

Nobl[1] has described six cases of a peculiar disorder of the hair follicles located on the shoulders, back, and at the sides of the thorax. The lesions were non-inflammatory, comedo-like elevations, averaging about 1 cm. in height, and each lesion contained a number, from ten to a score or more, of short, slender hairs. Five of Nobl's six cases occurred in men. Nobl considers the condition a congenital dystrophic disturbance of hair growth affecting certain individual follicles.

[1]*Nobl*, Arch. f. Dermat. u. Syph., cxiv, p. 611, cited by Ormsby, Diseases of the Skin, Phila., 1915, p. 1063.

CANITIES.

Synonyms.—Grayness of the hair; Poliosis; Poliothrix.

Canities may be congenital or acquired. Congenital complete canities is rare, but occurs in albinism, and occasionally in persons with an otherwise normal integument. Congenital canities of a patchy type is less rare, and may exhibit a strong hereditary tendency, as in the cases reported by Goodell, Strickler, and others. In acquired canities the condition may develop rapidly or slowly, and in elderly individuals (canities senilis) or in early adult life (canities prematura). In the latter instances heredity is often an important factor. The pigmentary loss may be localized as in partial albinism, in regrowths following some attacks of alopecia areata, and in certain nerve injuries, or generalized. Sudden blanching of the hairs is an extremely rare phenomenon, but it undoubtedly does occur in some instances.

Ring Hairs.—Ring-like grayness of the hair is a peculiar disorder in which many or all of the hairs of the moustache or scalp exhibit rings of white alternating with rings of pigment. Aside from the pigmentary changes, the filaments are apparently normal.

Etiology and Pathology.—Acquired whitening of the hair is usually a senile change, and a strong hereditary tendency is noted in many instances. Prolonged fevers, and various wasting diseases tend to hasten its development. Worry, overwork, grief, anxiety, and nervous strain are strong predisposing factors. In the localized types of canities nerve injury often plays an important part. In the cases of sudden blanching, there is frequently a history of severe nervous shock. Whiteness may be due to either lack of pigment in the shaft or the presence of air bubbles between the cells. Cases of sudden blanching are usually attributed to the latter cause.

Prognosis.—Generalized canities of either the congenital or acquired type is generally permanent. In the localized examples which occasionally develop following alopecia areata, and traumatic injuries of the nerves, recovery often takes place.

Treatment.—Aside from general systemic tonics, treatment is of little avail. The use of hair dyes, the majority of which contain silver nitrate, pyrogallic acid, or paraphenelene-diamine, is frequently injurious to the scalp and should not be encouraged.

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CANITIES.—*Goodell,* Med. Times and Gaz., 1884, i, p. 180. — *Stricker,* Virchow's Arch. f. path. Anat., 1887, lxxiii, p. 623.

ALOPECIA.

Alopecia, or baldness, may be due to any one of a number of causes, and may be partial or complete, localized or universal. For convenience of description, the various types of hair loss may be separated into two general classes—congenital alopecia (alopecia congenita), and acquired alopecia (alopecia acquisita), and the latter variety, in turn, may be subdivided into several distinct forms:

- Alopecia acquisita
  - Alopecia senilis
  - Alopecia præmatura
  - Alopecia areata
  - Alopecia symptomatica
    - Constitutional origin.
      - General toxemias.
      - Mineral poisons.
      - General cachexias.
    - Local origin.
      - Direct trauma.
      - Injuries to nerve trunks.
      - Furunculosis.
      - Kerion.
      - Favus.
      - Chronic inflammatory disorders (particularly seborrheic dermatitis).
      - Ulcerating syphilides.
      - Lupus erythematosus.
      - Folliculitis decalvans.

Alopecia Congenita (Alopecia Adnata).—In this form of baldness the hair loss may be partial or complete, and is accounted for by the lack of normal development, or even the absence of a majority or all of the follicles. Other tegumentary defects, such as partial or complete absence of the teeth or nails, may also be present. The sebaceous and coil glands may likewise exhibit alterations. Heredity is the only known etiologic factor. Males are affected oftener than females (2 to 1). Schede found rudimentary follicles sparsely scattered over the affected areas.

Alopecia Symptomatica.—This variety of baldness may be due to any one of several constitutional or local causes, as C. J. White and others have shown. Alopecia is a not uncommon manifestation of toxemia in the acute specific fevers and in syphilis, and may be of patchy, or more or less generalized distribution. Following the influenza epidemic of 1918-19, numerous cases of toxic alopecia occurred. Complete regrowth gradually takes place following recovery from the parent disorder. The ingestion of thallium acetate, a remedy which at one time was employed for the relief of excessive

sweating in tuberculosis, may give rise to an alopecia which persists so long as the drug is continued.

Cachectic alopecia is a not infrequent condition in tuberculosis, and may occur in diabetes mellitus, and other wasting disorders. The hair loss is qualitative as well as quantitative, the few new hairs in the regrowth usually being finer and more lanugo-like than the old, and complete recovery seldom if ever takes place. In alopecias of consti-

Fig. 750.—Congenital alopecia. (Courtesy of Dr. Harold N. Cole.)

tutional origin, the internal treatment is that of the parent disease. Locally, the scalp is to be kept clean, and stimulating applications systematically employed.

Alopecia from local causes is due to destruction of the follicles by ulceration and by the formation of scar tissue. In addition to the various traumatic injuries, including burns, furunculosis, ulcerating syphilides, and kerions occasionally give rise to patchy baldness. Lupus erythematosus of the scalp may involve areas of con-

siderable extent, and the ensuing hair loss, as in all forms of alopecia cicatrisata, is permanent. In morphea also, baldness is a characteristic feature of the affected areas. In ringworm the hair loss is due to destruction of the hair shafts, the bulbs being unaffected. Consequently, the alopecia is temporary, regrowth being only a matter of time.

Of the chronic inflammatory disorders of the scalp which give rise to hair atrophy and hair loss, seborrhea and seborrheic dermatitis are by far the most common. The ensuing baldness, which is sometimes referred to as *alopecia pityroides,* or *alopecia furfuracea,* first

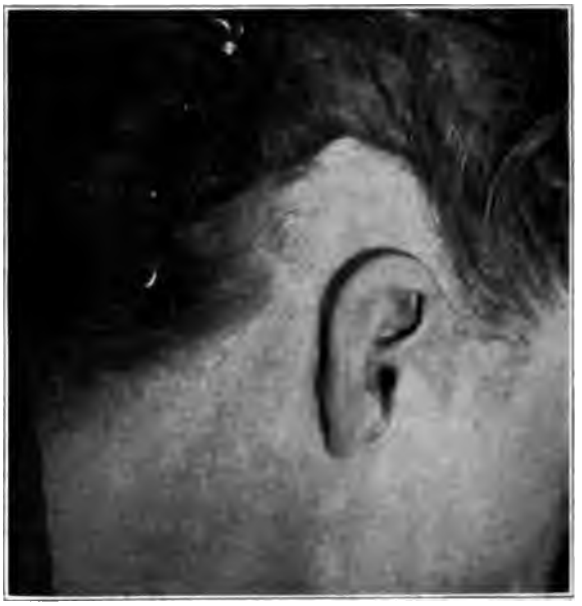

Fig. 751.—Alopecia due to lupus erythematosus.

involves the temporal and frontal regions, and is accompanied by more or less furfuraceous desquamation of the corneous layer. The seborrheal disorder usually attacks young adults and may persist for several years before the hair loss becomes sufficient in amount to attract the patient's attention. Commonly the hairs are dry, harsh and lusterless, although rarely they may be excessively oily. The thinning process is very gradual and as a rule a period of a decade or more elapses before the denudation is sufficient to become noticeable.

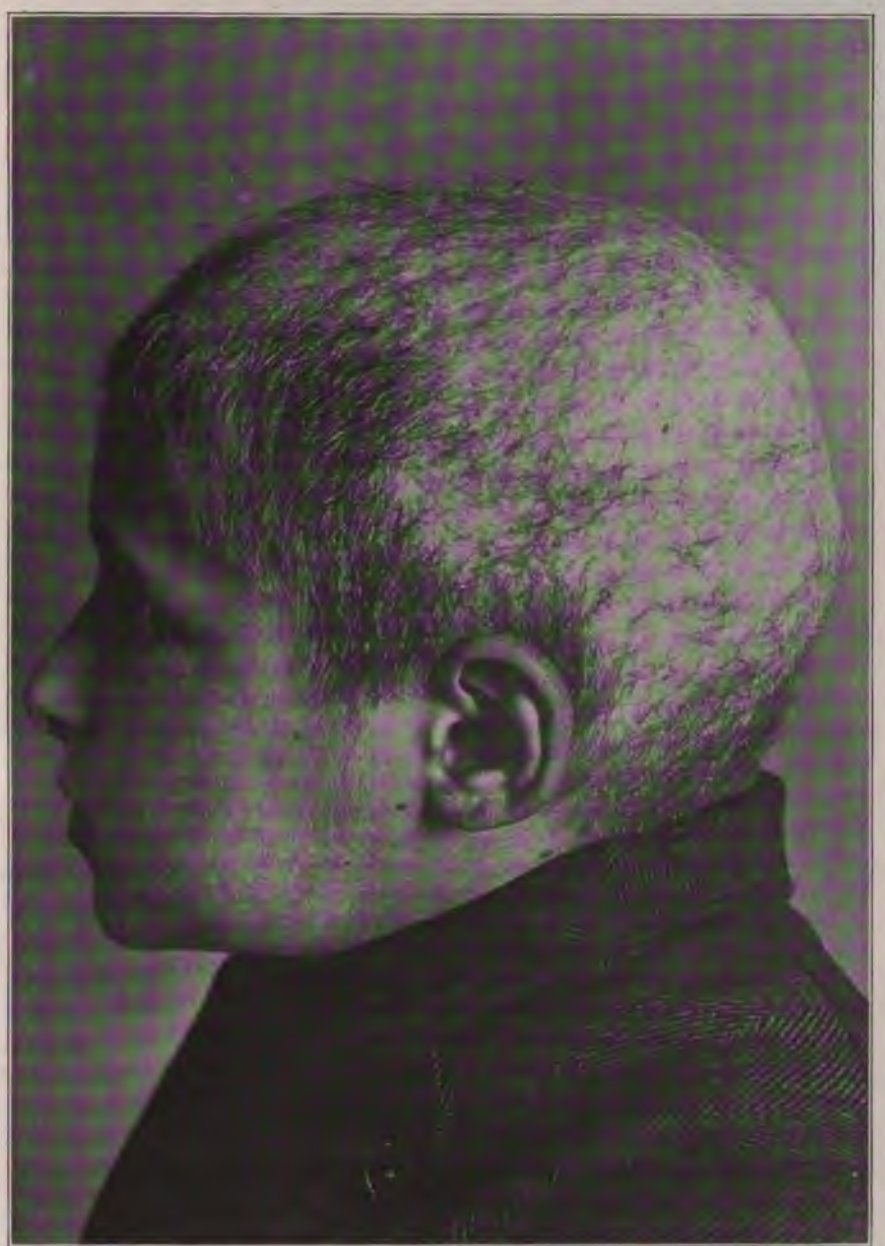

Fig. 752.—Atrophic alopecia in favus of scalp. (Courtesy of Dr. Geo. M. MacKee.)

Alopecia Senilis.—This variety of baldness is largely due to the atrophy of old age, and is characterized by symmetric thinning of the hair on the vertex and in the temporal regions, although occasionally nearly the entire calvarium is involved. The hair loss is usually gradual, and a downy growth, with more or less accompanying evidence of seborrhea, may persist for months after the disappearance of the pigmented shafts. Rarely there is associated thinning of the hairs in the axillary and pubic regions. Unna found atrophy of the cutis, with thickening of the panniculus. The hair follicles, with their contiguous sebaceous glands, likewise exhibited atrophic changes. The onset of senile alopecia is undoubtedly hastened by a pre-existing seborrhea or seborrheic dermatitis of the scalp. In fact, Unna holds that alopecia senilis is in reality but a relatively delayed alopecia pityroides.

Alopecia Præmatura.—Premature alopecia is that form of acquired baldness which occurs without determinable cause in relatively youthful individuals. Some authorities consider this variety of hair loss under two headings—idiopathic premature alopecia and symptomatic premature alopecia. Inasmuch as the latter form has already been considered under the symptomatic alopecias, only the idiopathic form remains to be discussed. Idiopathic premature alopecia, like senile alopecia, usually begins on the vertex and in the temporal regions. As Stelwagon has pointed out, however, the baldness gradually extends backward in elliptic shape, encroaching on the sides and middle of the scalp, until only a narrow fringe remains on either side, and a tongue-like projection in the middle, to mark the territory that was formerly abundantly covered with hair. In females the alopecia is seldom, if ever, so extensive; the hair loss being more or less diffuse.

The essential cause of the disorder is unknown. It is much commoner among the educated classes, and the majority of its victims are men. Jamieson, Stelwagon, and others are of the opinion that the wearing of hats, especially stiff hats, which tend to bind the temporal arteries, and thus impede circulation, is a contributory factor. Pusey and Harding, on the other hand, hold that the fashion of going without hats, particularly during the summer season, may be an exciting factor in causing baldness. Ellinger has suggested that frequent washing of the scalp without sufficiently drying the hair afterward, is causative in many instances. Pincus has called attention to the fact that in certain families there is a tendency to

sclerosis of the connective tissue underlying the aponeurosis of the occipito-frontalis muscle, with consequent diminution in the blood supply to the superjacent integument. This condition is a not infrequent one, particularly in women, and is characterized clinically by a peculiar, hidebound condition of the scalp, with associated hair loss of variable degree *(alopecia indurata atrophica)*.

Treatment.—It is extremely doubtful if any constitutional remedy exerts a specific action in cases of baldness. As in all cutaneous disorders, however, the patient's general health should receive careful attention, and all indications be promptly met. Of the various prophylactic measures that have been suggested, daily care of the hair and scalp is one of the most important. The public should be apprised of the fact that in the prevention of disease individual combs and hair brushes are just as essential as individual toothbrushes. Frequent massage and kneading of the scalp, preferably with the fingers rather than a mechanical vibrator, is a valuable measure, particularly if regularly and systematically carried out. If the scalp is extremely oily, it may be washed as often as twice a week, but care should be taken to rinse out all of the soap, and thoroughly dry the hair and skin afterward. It should always be borne in mind that seborrhea and seborrheic dermatitis, particularly the latter, are the most frequent of all causes of hair loss, and at the first sign of the presence of these disorders treatment should immediately be instituted. Of the various local medicaments, those possessing both stimulating and antiseptic properties are to be preferred, and may be prescribed both in the form of lotions and ointments. As an adjuvant measure, in the oily cases, it is often advisable to shampoo the scalp once a fortnight, or oftener, with tincture of green soap, a good tar soap, or egg yolk (a substance which probably owes its healing properties, if any, to the sulphur it contains). A good plan is to employ a liquid application on six evenings of each week, and an ointment preparation on the seventh. The scalp can then be thoroughly cleansed by shampooing the following morning, and the tonic treatment again instituted. The stimulating agents that have been suggested cover a wide field. Bichloride of mercury is one of the most valuable, and may be prescribed in strengths of .02 to .05 percent. Chloral hydrate likewise has proved serviceable in my hands. C. J. White speaks favorably of euresol (mono-acetate of resorcin), and strongly recommends the following formula, devised by Elliot:

℞ Hydrargyri chloridi corrosivi.....gr. i (0.06)*
Euresolis pro capilli.....3 i (4.0)
Spiritus acidi formici, N.F.....3 ii (8.0)
Olei ricini .....♏ xxx (2.0)
Alcoholis .....q. s. ad f℥ iv (120.0)
Misce.
*This quantity may be doubled, if indicated.

Care should be exercised in order to avoid irritating the scalp too much, and for this reason it is often advisable to decrease the amount of bichloride in this mixture. A somewhat similar combination was first suggested to me by Strobel, and is very efficient:

℞ Hydrargyri chloridi corrosivi.....gr. iii (0.2)
Resocinolis .....3 i (4.0)
Ætheris .....f3 iii (12.0)
Alcoholis .....f℥ i (30.0)
Spiritus myrciae .....f℥ iiiss (105.0)
Aquae rosae .....q. s. ad ℥ vi (180.0)
Misce.

Another formula which is both curative and inexpensive was originated, I believe, by Johnston:

℞ Hydrargyri chloridi corrosivi.....gr. ½ (0.02)
Chlorali hydrati .....3 ii (8.0)
Spiritus acidi formici, N.F.....3 iv (15.0)
Olei ricini .....♏ xv (1.0)
Alcoholis .....q. s. ad f℥ vi (180.0)
Misce.

Resorcin is liable to give rise to more or less staining in white or gray haired individuals, and an additional drawback lies in the fact that not all preparations of the drug are dependable, consequently it is safer to rely on other agents. Ichthyol is a favorite with Unna, and the following mixture, suggested by Sabouraud, is highly endorsed by Chipman:

℞ Acidi salicylici .....3 ss (2.0)
Ichthyolis .....3 ss (2.0)
Liquoris carbonis detergentis.....3 iss (6.0)
Alcoholis (25%) .....q. s. ad f℥ vi (180.0)
Misce.

In excessively oily cases Jackson and Sabouraud both recommend a stimulating mixture containing ether and ammonia:

℞ Pilocarpinae hydrochloridi .....gr. iv (0.25)
Aquae ammoniae .....ʒ i (4.0)
Spiritus lavandulae,
Spiritus ætheris .....āā ʒ viss (26.0)
Alcoholis (25%) .....q. s. ad fʒ viii (240.0)
Misce.

Occasionally a powder preparation is preferable to a liquid, and Chipman has found the following combination, devised by Sabouraud, a helpful one:

℞ Sulphuris,
Magnesii carbonatis,
Tannoformi,
Zinci oxidi .....āā ʒ iv (15.0)
Misce. Signa: To be applied at night.

Ointments.—Ointments frequently are more beneficial than lotions, but are "mussy" and disagreeable to use. Of the numerous ointment bases, lard, stiffened, if necessary, by the addition of a small proportion of paraffin, is probably as good as any. The most efficient remedial agents for application in this form are sulphur, salicylic acid, tar, and betanaphthol. An excellent combination consists of salicylic acid (5 per cent), and precipitated sulphur (15 per cent), in lard, or rosewater ointment. Knowles speaks highly of betanaphthol (12 per cent), in equal parts of lanolin and petrolatum. Lotions may be applied with a medicine dropper, and thoroughly rubbed in, once or twice daily. Ointments also should be well rubbed in, not simply smeared over the surface. The temporary hyperemia resulting from the application of the high frequency spark, or a faradic brush or comb proves beneficial at times, and in many instances I have found the Alpine Sun Lamp, a mercury vapor instrument somewhat resembling in principle the Kromayer lamp, a valuable aid, particularly in the early cases. Dieffenbach also speaks highly of this therapeutic agent.

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ALOPECIA SENILIS.—*Unna*, Histopathology.

ALOPECIA PRÆMATURA.—*Pincus*, Berl. klin. Wchnschr., 1883, p. 645. — *Ellinger*, Virchow's Arch. f. path. Anat., 1879, lxxvii, p. 549. — *Pusey*, loc. cit. — *Sutton*, Jour. Cutan. Dis., 1912, p. 471 (alopecia indurata atrophica).

ALOPECIA SYMPTOMATICA.—*C. J. White*, Jour. A. M. A., 1910, iv, p. 1074. — *Elliot*, New York Med. Jour., 1895, lxii, p. 525. — *Jackson*, Jour. Cutan. Dis., 1900, p. 352. — *Chipman*, Calif. State Jour. Med., 1906, iv, p. 81; Idem, ibid., 1908, vi, p. 307 (two valuable papers on seborrheic conditions of the scalp). — *Hazen*, Jour. A. M. A., 1919, lxxii, p. 349 (alopecia following influenza).—*Ayres*, Boston Med. and Surg. Jour., 1919, clxxx, p. 464 (an interesting and valuable paper on postinfluenzal alopecia).

ALOPECIA DUE TO THALLIUM ACETATE.—*Ruschke*, Monatsh. f. prakt. Dermat., 1900, xxxi, p. 570. — *White*, Med. Clin. North America, 1918, i, p. 971. — *Dieffenbach*, Am. Jour. Electrotherap. and Rad., 1917, xxxv, p. 407.

ALOPECIA AREATA.

Synonyms.—Alopecia circumscripta; Area Celsi; Porrigo decalvans.

Definition.—A disorder characterized by sharply circumscribed areas of total baldness. The affection occasionally involves regions other than the scalp, and, in rare instances, gives rise to alopecia universalis.

Symptoms.—The bald patches develop suddenly on apparently normal skin, and vary greatly in size and shape. The scalp is the

Fig. 753.—Alopecia areata.

Fig. 754.—Alopecia areata of rather unusual distribution.

site of predilection, although the eyebrows, the bearded region, and even the pubes and axillae may in exceptional instances be involved. Often the first intimation the patient has of the presence of the disorder is the sudden detachment of a large bunch of hair during the process of combing or brushing. Occasionally the outfall is gradual, several days or more being required for the development of appreciable baldness. The spots enlarge peripherally for a few days or weeks, and several or more may coalesce, with consequent development of areas of wide extent. In the generalized cases, which fortunately are somewhat rare, all of the hairy regions are affected, and the scalp, brows, face, axillae, and pubes are absolutely bare.

At the margins of the lesions the shafts may exhibit atrophic changes near the mouths of the follicles (the so-called "exclamation point" hairs), and many become loosened, and can be easily and painlessly extracted. The bald plaques are pinkish or whitish in color, of normal consistence, and of various shapes and sizes. Commonly they are round or oval in outline, but occasionally they are oblong, circinate or band-like *(Ophiasis)*. The last named clinical type may

Fig. 755.—Two cases of alopecia universalis.

Fig. 756.—Alopecia areata involving only the upper eyelids.

involve the entire margin of the scalp, and is observed most frequently in children. In the ordinary cases, regrowth takes place slowly. The first crop of hair is usually thin, colorless, and lanugo-like, and often falls out after the shafts have attained a length of a centimeter or two. The second or third growth usually persists, however, although the constituent hairs may remain uncolored, thus giving rise to a peculiar, mottled appearance of the scalp. Associated atrophic disorders of the skin, such as leukoderma and scleroderma,

are sometimes present on both the affected areas and on other parts of the body. Nail changes also are occasionally noted.

Etiology and Pathology.—The exact cause of alopecia areata is not known. The disease is commonest between the first and third decades of life, and affects the sexes with about equal frequency. There are two generally accepted theories regarding its etiology. One points to a parasitic, the other to a neurotic origin. It is probable that both are correct. Typical lesions sometimes develop as a result of traumatic neuritis, and I have seen a classical example

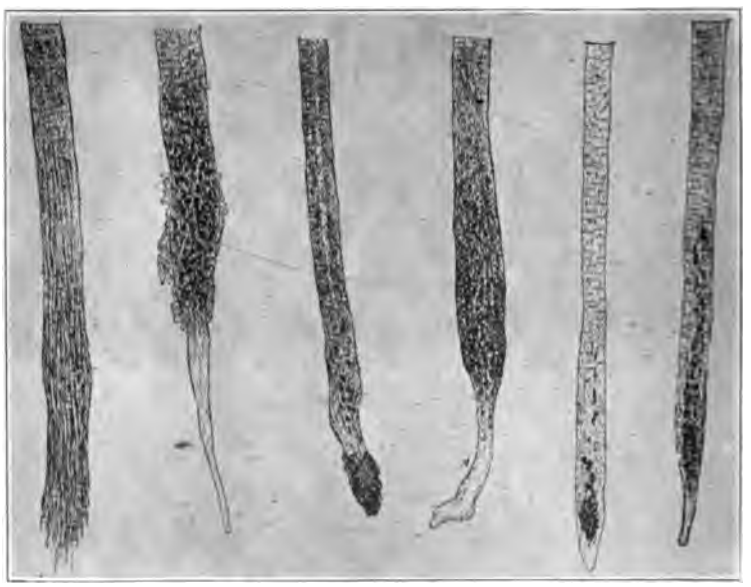

Fig. 757.—Hairs from the margin of alopecia areata patches. (Courtesy of Dr. Andrew R. Robinson.)

following a supraorbital zoster. It is not improbable that the disorder is in some respects analogous to herpes zoster and to anterior poliomyelitis, and that it may result from any one of several causes, acting on certain nerve trunks or ganglia. The most frequent of these is probable infection with a specific micro-organism (which theory would go far toward explaining the occasional epidemics that have been reported by Bowen, Pusey, and others), although hemorrhage, trauma, or mineral poisons (such as thallium acetate) may be important etiologic factors in some instances. In a number of instances, I have found associated streptococcic infection of the teeth

(apical abscesses and granulomata) and tonsils; a fact to which Lain, Chipman, Duke, and others also have called attention. Grindon found that many of his alopecia areata patients suffered from decayed teeth, and believes that dental irritants, and particularly, "the presence of amalgam fillings, and still more, of amalgam and gold in the same mouth in so large a proportion of cases points to something more than a mere coincidence." Nervous shock, anxiety, mental worry and similar conditions probably serve more as predisposing than as causative factors, just as in acute, generalized cases of

Fig. 758.—Alopecia areata, showing changes in follicle after loss of hair. Low magnification.

lichen planus. The theory that a large percentage of the cases is directly due to either ringworm (as suggested by Crocker), or syphilis (as claimed by Sabouraud) is extremely far-fetched. It may be that the irritation is peripheral (although in my opinion this is not probable), in which case the micrococcus described by Vaillard and Vincent comes nearer than any other to fulfilling the essential requirements.

The histopathology of the cutaneous lesions has been exhaustively investigated by Robinson.

The process is an inflammatory one from the first, and is primarily

perifollicular. In a patch of one week's duration he found the epithelium and rete normal, with slight inflammation of the papillary layer, and marked inflammatory changes (as shown by the presence of considerable round-celled perivascular infiltration) in the corium. The infiltration was not general, but limited to areas in the section, and Robinson considered this fact an important point in favor of a local microbic etiology. The subcutaneous tissue was normal, as were also the sebaceous and sweat glands.

Diagnosis.—The disorder is liable to be confused with ringworm of the scalp. The smooth, entirely bald, sharply defined character of the alopecia areata patches, the rapidity of their development, the presence of "!" (exclamation point) hairs and the absence of broken hairs and of ringworm fungus should be sufficient for recognition. Cicatrices due to trauma or to disease (particularly lupus erythematosus, morphea, lupus vulgaris and syphilis), may at times resemble alopecia lesions, but their character and history usually are distinctive.

Prognosis.—The favorableness of the prognosis varies indirectly with the age of the patient and with the extent of the baldness. Relapses are frequent, and recurrences not uncommon, but in children and in young adults complete recovery can usually be safely predicted in all except the universal cases. In patients over 40 the outlook is less promising, however, and the prognosis should be guarded.

Treatment.—Of the various constitutional remedies that have been recommended none is specific. Arsenic, iron, cod-liver oil, and similar tonics are indicated, should the patient's general health be below par. Believing, as I do, that the disorder is essentially due to ganglionic injury, following trauma, or infection, during the past four years I have prescribed hexamethylenamine as a routine measure in all of my alopecia areata cases. The dosage varies, but the majority of patients can comfortably take from five to ten grains (0.3 to 0.6), in plentiful amounts of water, after each meal for considerable periods of time. If there is any resulting vesical irritation the remedy should be withdrawn for a few days and then its use gradually resumed. I believe the drug exerts a favorable influence in the majority of instances. At any rate, my results have been far more satisfactory since its adoption than before. Locally, stimulating applications are the most valuable. The majority of those recommended are antiseptic as well as irritating, but in the selection of a remedy bactericidal properties are of secondary importance.

The list includes a wide variety of drugs—tar, mercuric chloride or iodide, chrysarobin, betanaphthol, croton oil, aquae ammoniae, tincture of cantharides, trikresol, and phenol. Of these various agents, phenol (95 per cent), as originally recommended by Bulkley, has proved the most efficient in my hands. The remedy may be applied full strength to bald patches on the scalp and eyebrows, but should be diluted one-half with glycerine when treating lesions on the face. It may be painted on twice weekly, care being taken to avoid covering too large an area (not more than 50 square centimeters at one time). I prefer to apply only a thin film, and allow it to remain on the skin, but many authorities recommend that the phenol be immediately followed by liberal applications of ethyl alcohol.

Knowles highly recommends an ointment consisting of pilocarpine hydrochlorate 1 grain (0.06), betanaphthol 1 dram (4.0), lanolin 2 drams (8.0), and petrolatum 5 drams (20.0). The preparation is rubbed thoroughly into the areas twice daily for five to ten minutes on each occasion. The percentage of betanaphthol should be gradually increased until slight temporary redness is produced.

In addition to this local irritant, I generally prescribe a stimulating tonic, such as mercuric chloride dissolved in alcohol, mainly for the purpose of stimulating the growth of the hair and eradicating any lesions of seborrheic dermatitis that may be present. The following mixture has proved very satisfactory in my hands:

℞	Hydrargyri chloridi corrosivi.....gr. ⅛	(0.01)
	Chlorali hydrati .....3 ii	(8.0)
	Spiritus acidi formici, N.F.....3 iv	(15.0)
	Olei ricini .....♏ v	(0.3)
	Alcoholis .....q. s. ad f3 vi	(180.0)

Misce et signa: Shake and apply at night.

An occasional massage is helpful, principally as a circulatory stimulant. The high-frequency electrode sometimes proves serviceable. King and Parker, of Portland, speak highly of the Kromayer lamp as a therapeutic agent in this disease, and Finsen, Ormsby, Forchhammer and many others have also employed phototherapy with favorable results.

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FOLLICULITIS DECALVANS.

Synonyms.—Alopecia cicatrisata; Quinquaud's disease; Folliculite épilanté.

Quinquaud, Brocq, Neumann, and others have described instances of circumscribed alopecia due to folliculitis with subsequent scarring. While the symptomatology of the reported examples has been

Fig. 759.—Alopecia cicatrisata.

Fig. 760.—Alopecia cicatrisata.

slightly variable, the essential characteristics, particularly with respect to the ultimate results, are very similar, and it is probable that the various conditions are allied, if not identical. In the cases described by Quinquaud, the bald patches, which were usually located on the scalp, were about 5 cm. in diameter, with whitish, slightly depressed, atrophic centers, and inflammatory, margins. The essential lesion was a reddish, pinhead-sized, inflammatory papule or pustule, located at the mouth of the follicle and pierced by a hair. Crusting or dessication soon occurred, and, in the course of ten days or a fortnight, the epidermal débris became detached and dropped off, and the loosened shaft came with it. The bald patch enlarged by gradual peripheral extension, and in the

majority of instances the disease was slowly, but steadily, progressive. Occasionally a small tuft of hair escaped, to stand out, oasis-like, in the bald area. A less inflammatory type of the disorder is represented in the pseudopelade of Brocq. This form is characterized by the development of one or more, smooth, polished, slightly depressed, alopecia areata-like areas, with whitish floors, and pinkish, slightly elevated borders. A few of the marginal shafts can usually be readily extracted, together with their somewhat thickened, glossy sheaths (Robinson), but "exclamation point" stumps are absent, and the usual signs of folliculitis are wanting. As in Quinquaud's disease, the follicular destruction in the involved area is usually complete, and regrowth never occurs. Many of the patches are circular or ovoid in outline, although they may be narrow and elongated (the "alopecia serrata" of Crocker). The scalp is the common site of the malady, although the bearded region may be involved, as in Chipman's patient.

Etiology and Pathology.—The majority of the cases occur in males and develop in the fourth decade of life. The essential cause of the condition is unknown. Lenglet, who examined material obtained from Brocq's cases, found inflammatory perivascular changes, particularly in the neighborhood of the lower half of the sheath of the affected follicles. The infiltrate consisted chiefly of leucocytes, although a few plasma cells and mast cells were present. The sebaceous glands were atrophied, and the papillae were flattened, and contained pigment cells. The epidermal changes were apparently secondary. The stratum corneum was slightly thickened, but the prickle layer was thinned, and the granular stratum had entirely disappeared.

Diagnosis.—The lesions are to be distinguished from those of alopecia areata and lupus erythematosus. In alopecia areata the bald spots frequently appear suddenly, there is no bordering inflammation, and scarring is absent. In lupus erythematosus the scalp is seldom the sole site of the disease, the patches are infiltrated, and gaping follicular orifices are usually present near the margins of the affected areas.

Prognosis.—The ensuing alopecia is permanent, although the areas seldom become extensive, and the progress of the disease can sometimes be arrested by treatment.

Treatment.—Tonics, particularly arsenic and cod-liver oil, often prove serviceable. The hair at the margins of the lesions should be clipped, or, preferably, epilated. Quinquaud found tincture of

iodine a valuable remedy. An iodine (10 per cent) and goose grease combination is probably better, because of its superior penetrative power. The oily mixture should be thoroughly rubbed in twice daily. Ointments containing ammoniated mercury (10 per cent), betanaphthol (5 to 10 per cent), or sulphur and salicylic acid (5 per cent), may also be tried. Jackson speaks highly of colloidal sulphur (10 per cent), with salicylic acid (3 per cent), in equal parts of goose grease and wool fat. The entire scalp should be frequently washed with soap and water, and a reliable antiseptic, such as bichloride of mercury in alcohol (1 to 2,000), applied daily.

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SYCOSIS VULGARIS.

Synonyms.—Sycosis; Sycosis non-parasitica; Sycosis coccogenica; Folliculitis barbae.

Fig. 761.—Sycosis vulgaris, showing papules and pustules, all of which are pierced by hairs. (Courtesy of Dr. L. W. Ketron.)

Definition.—A chronic folliculitis or perifolliculitis of the bearded and upper-labial regions, due to infection with certain strains of the yellow or white staphylococcus.

Symptoms.—The disease is usually limited to the bearded region, and the essential macroscopic lesions are deep-seated or superficial papules or pustules, pierced by hairs. In the earlier stages of involvement, the shafts may be firmly attached, but after a lesion has persisted for several or more days, the filament, usually with its loosely adherent root-sheath, can usually be easily extracted. In the

Fig. 762.—Sycosis vulgaris, of three years' duration. The involvement is extensive and quite typical.

older, pustular, lesions the hairs are commonly quite loose. The malady often begins on the upper lip, accompanying or following a nasal catarrh, and from this locality gradually spreads to other parts of the face. Ultimately, but rarely, it may involve not only the moustache and bearded regions, but the eyebrows, scalp, axillae, and pubes as well. In the majority of instances the hair destruction, with subsequent cicatrization, is comparatively slight, although in those cases

which are characterized by the formation of deeply seated abscesses, the succeeding alopecia may be quite extensive, and scarring a prominent feature. The inflammatory process is seldom so acute or so severe as in tinea barbae, and while infiltration and thickening may be present, the large, boggy, kerion-like swellings characteristic of this affection are absent. As a rule, the lesions do not coalesce, and the clinical picture remains that of a discrete, pustular folliculitis. The eruption may be limited to one or two small areas, or it may involve the entire bearded region. The patches may be reddened and moist, and occasionally there is more or less associated burning and itching. The course of the disease is essentially chronic, and while a few of the lesions may undergo spontaneous involution, new crops of papules are constantly springing up, consequently an attack may be prolonged over a period of months or even years.

Unna has suggested the designation of *"ulerythema sycosiforme"* for a chronic inflammatory disorder which was first described by Milton under the title of *lupoid sycosis,* and which begins in the outer portions of the bearded region and is characterized by gradual but progressive involvement of the hair follicles in this locality, with resultant hypertrophic scarring and permanent alopecia.

Etiology and Pathology.—While Tommasoli and Preis have each reported cases due to a bacillus, and Wright one in which the gonococcus was apparently causative, it is now generally accepted that sycosis vulgaris is due to infection with certain strains of the ordinary pyogenic cocci (Staphylococcus aureus and albus). The organisms probably enter the tissues through the hair follicles, and trauma, such as results from the use of a dull razor, local irritation, or any other cause which tends to lessen the epidermal resistance, predisposes an individual to attack. Lowered states of health likewise are contributory factors in many instances. The results of the researches of Robinson, Wertheim and others show that the disorder is primarily a perifolliculitis with subsequent abscess formation, largely as a result of the serotactic properties of the infecting organisms. The contiguous sebaceous glands are also involved. In the less severe cases the majority or all of the papillae escape destruction, and regrowth occurs.

Diagnosis.—The malady is to be differentiated from pustular eczema, impetigo contagiosa, and tinea barbae. In pustular eczema only a few if any of the lesions are papular, or are pierced by hairs, and the patches are illy defined, and tend to involve the adjacent

glabrous skin. No loose hair shafts are present, and itching is a constant and prominent symptom. The primary lesions of impetigo contagiosa are superficial vesicles, and are follicular only by accident. Their course is rapid, and their duration relatively short, and the hair shafts are never involved. In tinea barbae the moustache area usually escapes, many of the lesions are deep, boggy, and kerion-like, and the presence of the fungus can be readily demonstrated.

Prognosis.—The disease is an obstinate and persistent one, prone to relapses and recurrences, and seldom if ever disappears spontaneously. In cases of long standing, and of extensive involvement, it is often extremely difficult to bring about a cure, and even with modern methods of treatment from three months' to six months' or more attention is usually required.

Treatment.—Aside from the adoption of general hygienic measures, to increase the resistance of the patient, the usual constitutional remedies are of little, if any, value. Vaccine therapy gives brilliant results in some cases of the disease, but in many instances there is no ensuing benefit. Autogenous preparations should always be tried, however, if procurable, as they may benefit the condition, and are not likely to prove harmful. Of the various local remedial agents, none is so valuable as the x-rays. Popularized in this country by Pusey, the employment of radiotherapy in the treatment of sycosis has met with general adoption, and much satisfaction. MacKee, Wise, Hazen, and many other authorities recommend a single erythema (depilating) dose, but excellent results can be secured, with a greater degree of safety, by small, repeated doses. The usual precautions should of course, always be observed. If any acute inflammation is present it should first be subdued by means of soothing applications, as lead and opium lotion, aluminum acetate solution, or boric acid ointment. The hair should be kept closely clipped or, better, frequently shaved off, and all abscesses drained. If radiotherapy is unavailable, the patient should be supplied with a good pair of epilating forceps and instructed in the removal of the diseased hairs. Each day the involved area should be carefully inspected, and all of the affected hairs epilated. Afterward, alcohol may be applied, and this is followed by an antiseptic ointment, as ammoniated mercury (2 to 10 per cent), in rose water ointment, or in benzoinated lard, or a medicated lotion, as lotio alba, may be prescribed. Stelwagon recommends ointments containing precipitated sulphur (4 to 25 per cent). In prescribing antiseptics for use on inflamed areas, it is well to begin with mild preparations, and

gradually work up to the stronger ones. In the old, long-standing, infiltrated cases, recourse may be had to stimulating agents, as ointments containing considerable percentages of ichthyol, tar, resorcin, or salicylic acid. The treatment of this and similar disorders by means of various antiseptics introduced into the follicles by cataphoresis has been advocated by Ehrmann, Sibley, and others, but in my hands the method has proved a dismal failure.

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2. DISEASES OF THE SEBACEOUS GLANDS. SEBORRHEA.

Synonyms.—Steatorrhea; Acne sebacea; Cutis unctuosa.

Definition.—A functional disorder of the sebaceous glands, consisting in an increase in the amount, and often alterations in the quality, of the sebaceous secretions.

Symptoms.—Under normal conditions sebum consists of free fat, dry epithelial cells, and epithelial cells which are undergoing fatty degenerative changes. A certain amount of this material is constantly being supplied to the general surface of the skin, and serves to protect the integument, and keep it moist and soft. Either the fat elements or the dry epidermic cells may be in excess. In the former case, *seborrhea oleosa*, the affected skin presents a shiny, greasy appearance, with widely dilated follicular orifices, many of which contain dirty, oily plugs (comedones). The form characterized by scale or crust accumulation in addition to the abnormal oiliness, is commonly known as seborrhea sicca. The line separating true seborrhea from seborrheic dermatitis in many instances is illy defined, and it is probably wiser to follow Unna's lead and place all cases presenting inflammatory manifestations, other than congestion, in the seborrheic dermatitis group.

Seborrhea Oleosa.—This variety, which corresponds to the hyperidrosis oleosa of Unna, occurs most frequently during the period of adolescence. While the face, particularly the nose and forehead, and the scalp are favorite sites for the disease, other regions are oc-

casionally involved. Some races are apparently more susceptible than others. The negro is especially prone to the disorder. Acne vulgaris is a not infrequent complication, and a concomitant seborrheic dermatitis is not unusual.

Seborrhea Sicca.—Aside from ichthyosis congenita neonatorum, or ichthyosis sebacea, with its resultant vernix caseosa, seen in the newborn, crusted or scaly seborrhea is a comparatively rare affection. The sebaceous glands are extremely active throughout early infancy, and neglect of cleanliness is usually promptly followed by the development of seborrheic dermatitis. Accumulations of dry, cheesy, seborrheal matter sometimes occur on the glans and corona in men and about the clitoris in women.

Etiology and Pathology.—Reflex venous congestion of the skin from any cause is a strong predisposing factor, consequently indigestion, constipation, and similar disorders are often contributory if not causative. The affection is a purely functional one, and is accompanied by no inflammatory changes. Sabouraud believes that a microbacillus is the causative agent, but the results of Schamberg's investigations would indicate that Sabouraud's organism occurs in aseborrheal as well as seborrheal individuals, and Jackson and McMurtry, Whitfield, and other competent observers likewise doubt its specificity. Unna has long held that the coil glands and not the sebaceous glands are at fault in seborrhea and similar disorders. While it is now generally accepted that the sweat glands are responsible for a small percentage of the fatty matter which finds its way to the surface of the skin, by far the greater portion is derived from the sebaceous system, as van Harlingen, Elliot, Beatty, and others have demonstrated.

Prognosis.—Seborrhea of the glabrous surfaces usually responds favorably to treatment. Cases involving the scalp often prove stubborn and resistant, however, and in the majority of instances more or less alopecia ultimately results. Seborrheic dermatitis is a not infrequent complication.

Treatment.—Any underlying constitutional factor should, if possible, be remedied or removed. Of the various local remedial agents, the x-rays, sulphur, and resorcin are the most valuable in those instances presenting involvement of the glabrous skin, and sulphur, resorcin, and mercury in the hairy regions. The skin should be frequently cleansed with soap and water, alcohol, or benzine. The x-rays may be employed bi-weekly or on alternate days, and care should be taken to avoid any evident reaction in the skin. In facial

cases, the eyes, eyebrows, and lips should always be protected by lead foil. An exposure of from 3 to 5 minutes, at a tube distance of 15 centimeters, is usually sufficient. A fairly soft tube is to be preferred. Of the various sulphur preparations, lotio alba is one of the best. It may be applied at night, and a powder, consisting of sulphur, 1 part, and talcum, 8 parts, dusted freely over the surface during the day. Alcoholic solutions of resorcin (1 to 10 per cent) sometimes prove more satisfactory than sulphur, and are particularly valuable in seborrhea of the genitals. The treatment of seborrhea of the scalp is considered under the alopecias.

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ASTEATOSIS.

Synonyms.—Xerosis; Asteatodes.

Asteatosis is a condition characterized by absolute or relative deficiency of sebum. It may be either idiopathic or symptomatic. Idiopathic asteatosis is extremely rare. The more common types of the symptomatic variety are those due to senility, to certain constitutional or local affections which give rise to trophic changes of the nervous system, as leprosy, and glossy skin, and to cutaneous disorders like xeroderma pigmentosum and ichthyosis. Frequent contact with alkalies, such as strong soaps and washing powders, may give rise to local asteatosis, with ensuing dryness, thickening, and induration of the affected integument. In the symptomatic cases the prognosis is dependent upon the removal or modification of the underlying causative factor. Locally, lubricants, as almond oil, olive oil, benzoinated lard, tallow or mixtures of lard and lanolin, or petrolatum and lanolin, are indicated. A small amount of soluble rose or oil of bergamot should be added, and the ointment may be thoroughly rubbed into the skin once or twice daily.

STEATOMA.

Synonyms.—Sebaceous cyst; Wen; Atheroma.

Definition.—Steatomata are smooth, globular, pea- to orange-sized or larger, cutaneous or subcutaneous tumors which arise from the se-

baceous glands, and are usually located on the scalp, neck, back or scrotum.

Symptoms.—The tumors may be single or multiple, and are of variable color and consistence. They may be whitish, pinkish, or purplish in hue, and soft, doughy, elastic, or firm to the touch. They commonly occur in middle age, and are rare in the developmental period of life. Females are affected more frequently than males. The scalp is the site of predilection, although the neck, face, scrotum, and back occasionally are involved. In shape the lesions may be rounded, flattened, or irregularly globular. Rarely the central glandular orifice persists, although it may be occluded by a black, horny, comedo-like plug. The surface of the tumor is usually smooth and shiny, owing to the atrophy of the follicles as a result of stretch-

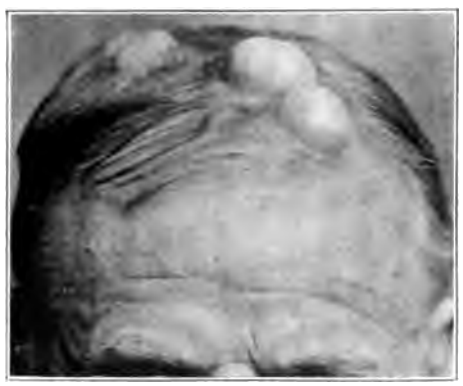

Fig. 763.—Sebaceous cysts of scalp. (Courtesy of Dr. Arthur E. Hertzler.)

ing of the skin. Wens may disappear spontaneously following suppuration and the destruction of the lining membrane, or they may be the seat of a chronic inflammatory process, which in elderly individuals sometimes leads to carcinomatosis. Cutaneous horns occasionally develop from the small, patulous cysts. The larger tumors may reach an enormous size, and give rise to repulsive deformities. In the multiple cases, such as have been reported by Pollitzer and others, the number of growths present may total a hundred or more. *Chalazions* are small tumors analogous to sebaceous cysts which develop on the eyelids in connection with Meibomian glands.

Etiology and Pathology.—Aside from the fact that duct occlusion is a causative factor in some instances, the exciting cause of steatomata is not known. Virchow and Robinson regard them as reten-

tion cysts of sebaceous glands, Török, Chiari, and Franke as dermoid cysts, developing from embryonic remnants of the skin, and Unna as acanthomata of the sebaceous glands. Histologically, the tumors consist of encapsulated masses of epithelial cells in various stages of degeneration and disintegration, cholesterin crystals, and, occasionally, as in Stelwagon's case, hairs. The capsule is composed of fibrous connective tissue, and is lined with epithelium.

Diagnosis.—Sebaceous cysts are to be differentiated from dermoids, lipomata, fibromata, osteomata, and syphilitic nodes and gummata. The localization, number, course, and character of the lesions, and their intimate connection with the skin should serve to prevent confusion.

Prognosis.—As a result of long continued irritation the lesions may become carcinomatous, but in the majority of instances they are benign growths, which seldom disappear spontaneously, but are prone to recur unless completely extirpated.

Treatment.—The treatment is surgical. The smaller lesions can sometimes be eradicated by means of caustics applied to the walls of the sac after the contents have been squeezed out through a narrow incision. If the lining epithelium is not completely destroyed, however, recurrence takes place. The larger cysts should be dissected out, care being exercised to avoid rupture. In removing the smaller tumors, a straight incision can be employed, but in attacking the larger growths an elliptical incision should be made following the margin of the wen. In uncomplicated cases, the wound may be closed at once, but in those instances in which suppuration has already occurred, the cavity should be packed, and suturing omitted.

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MILIUM.

Synonyms.—Acne albida; Strophulus albidus; Grutum.

Definition.—Milia are small, dense, sharply circumscribed, non-inflammatory elevations due to retention beneath the epidermis of material from normal or rudimentary lanugo hair-follicles.

Symptoms.—The sites of predilection are the eyelids and the temporal areas, although the genital region occasionally is involved. The lesions are pinpoint- to pinhead-sized, rounded, whitish or yellowish, pearly tumors, which are slightly elevated above the general sur-

face of the skin. As a rule they are discrete, but rarely, as in the congenital cases reported by Crocker, Colcott Fox, Erasmus Wilson, and others, they may be grouped. The tumors develop slowly, and their presence gives rise to no subjective symptoms.

Etiology and Pathology.—Milia may be congenital or acquired. Robinson believes that two distinct types of the disorder exist. The first and most common is a result of any mechanical cause which tends to occlude permanently the lumen of one or more acini of a sebaceous gland, and prevent the escape of sebum to the surface, while the second is due to the presence of an encapsulated mass of

Fig. 764.—Milia.

Fig. 765.—Milium.

miscarried epithelium from a hair follicle or from the rete. Unna has shown that many of the cystic masses develop in connection with lanugo hair follicles. Aside from direct injuries, as incised wounds, milia often develop following exfoliation of the epidermis in dermatitis herpetiformis, pemphigus, scarlet fever, and epidermidolysis bullosa. Histologically, the tumors consist of tightly compressed, inspissated, calcified, or fatty masses of sebaceous material, enclosed in one or more thin envelopes made up of epidermal cells.

Diagnosis.—Milia must be differentiated from comedones, xanthelasma, and molluscum contagiosum. Comedones are seldom rounded, and always present a duct orifice and a central black plug. Xanthe-

lasma plaques are oval or elongated, chamois colored, and wrinkled. Molluscum contagiosum tumors develop rapidly, and are commonly much larger than milia.

Prognosis.—The little tumors are persistent, but harmless. They never undergo spontaneous involution, but calcification is a not infrequent sequel.

Treatment.—The occasional use of a mechanical keratolytic, such as pumice stone soap, or hand sapolio, will serve as a prophylactic measure, and often proves curative. An ointment containing salicylic acid (5 per cent) and sulphur (10 per cent) will "shell out" the more superficial masses. In the older and larger tumors, electrolysis, or, better, incision may be employed. The walls of the cavity should afterward be touched with a drop of caustic, as chromic acid (50 per cent) or formalin.

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COMEDO.

Synonyms.—Blackhead; Flesh-worm.

Definition.—A comedo, or "blackhead," is a mass of inspissated secretion blocking the excretory duct of a sebaceous gland.

Symptoms.—Comedones are usually soft, and consist of a mass of semi-solid fat, capped at the follicular orifice with a layer of bluish or brownish, pigmented horny débris. Occasionally the plugs are comparatively solid, and can be expressed as firm, oat-grain-shaped, semi-translucent bodies. The outer extremities of the plugs may lie below the general surface of the skin, flush with it or projecting slightly above it. The face, particularly the nasolabial folds and the forehead, is the commonest site of the lesions, although the concha of the ear, the dorsal surface of the trunk, the scrotum, and the shaft of the penis are frequently involved. Wolff has reported an interesting example of comedo of the arms. Exceptionally the lesions may exhibit a tendency to symmetric grouping, as in the cases reported by Thin and Crocker. The accumulations can be readily expressed, and emerge from the follicular orifices as elongated, worm-like masses. There may be some associated inflammation, but as a rule this feature is absent, except in the presence of a concomitant acne. Subjective symptoms likewise are trifling or entirely wanting. The course of the disorder is chronic, extending over a period of months or years.

Frequently there is an associated seborrhea, dermatitis or acne.

Etiology and Pathology.—Comedones may occur at any age, but they usually develop during the adolescent period of life. Rarely, as in the cases described by Crocker, Colcott Fox, Pusey, and Ormsby, the lesions may occur on the cheeks, forehead, and temples of nurslings, and others of tender years. The most important factors in the production of comedones are reflex or local disturbances which tend to increase the activity of the sebaceous glands. Thick-skinned, dark-complexioned individuals of the so-called "seborrheal type" are much more susceptible than others. Constipation, dyspepsia, chlorosis, and menstrual derangements are frequent contributory factors. Histologically, hyperkeratosis of the epithelium at the mouth of the follicle is the first step. Following this the comedo plug is gradually formed. Unna formerly ascribed the blackness of the outer tip of the plug to ultramarine derived from the secretions, but he now believes the dark color is the result of elaborate chemical changes in the excreted material. Owing to the pressure atrophy when two adjacent glands are involved, a single glandular chamber with multiple ducts (double, or triple comedo) may result (Ohmann-Dumesnil), and similar lesions probably occur as a sequel to tissue destruction in suppurative acne lesions (Düring). The so-called "bottle bacillus," a micro-organism first described by Unna and Sabouraud, is commonly present, and in addition to this organism, other micrococci, particularly the staphylococcus aureus and albus, are found in the lesions. An animal parasite, the demodex follicularum, is also a frequent inhabitant of the plugs. Grouped comedones are probably due to local irritation, a fact which would account for their frequent presence in the hat-band region in children, and over the occiput in infants.

Diagnosis.—The disorder is to be differentiated from milium. In the latter there is no central opening, and the summits of the lesions are whitish or yellowish instead of black.

Prognosis.—The affection is usually an obstinate and persistent one, but is amenable to treatment, and with the patient's co-operation it can be eradicated in the majority of instances.

Treatment.—Aside from the removal of the plugs by means of a special comedo extractor, or with the edges of the thumb nails, the treatment is essentially that of acne.

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ACNE.

Synonyms.—Acne vulgaris; Acne simplex.

Definition.—A chronic inflammatory disorder involving the sebaceous glands, characterized by the development of papules or pustules, usually intermingled with comedones.

Symptoms.—The face is the site of predilection, although the interscapular and sternal regions are frequently involved. Occasionally the shoulders also may be attacked, and in rare instances the entire

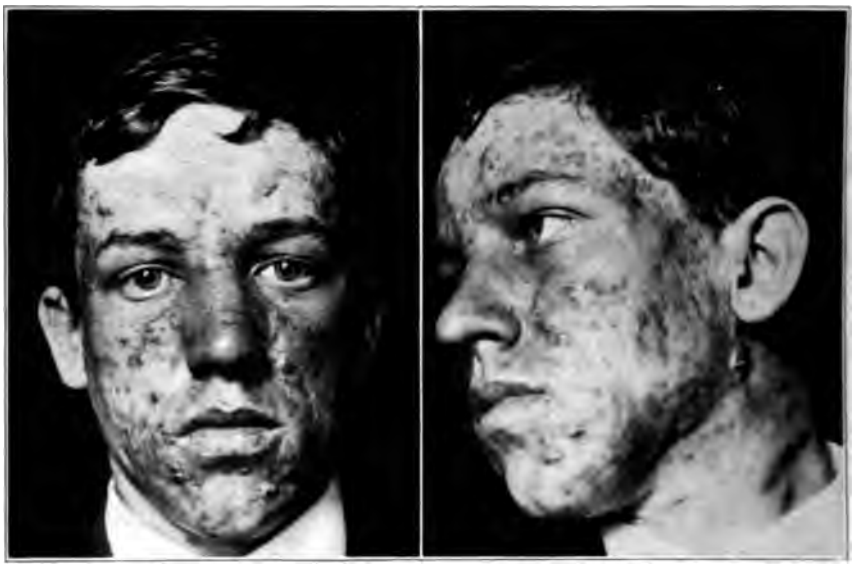

Fig. 706.—Acne vulgaris, indurated case of long standing. (Courtesy of Dr. H. C. Varney.)

dorsal surface of the trunk may be affected. As a rule the eruption is symmetric, and is practically limited to those areas where the sebaceous glands are normally plentiful and well developed. In the majority of instances the lesions develop slowly and insidiously, and persist several days or weeks. While acne papules and pustules may occur on normal or dry skins, in the majority of instances there is a concomitant oily seborrhea. In consequence, the integument appears relaxed, dark and greasy, and many comedones commonly are present.

The lesions are usually papular at first, and appear at irregular intervals. Later pustulation occurs, and, finally, desiccation, with more or less crusting. Many of the nodules disappear by absorption,

but a few may persist as sluggish, subcutaneous masses. The degree of inflammation varies. In the milder cases the lesions may not go far beyond the comedo stage, but usually they are polymorphic, each case presenting comedones, commingled with papules, pustules, and nodules in variable numbers. For convenience of description, various clinical types of the disease are recognized. Thus we have *acne simplex*, in which the lesions are superficial, and *acne indurata*, in which they are deeply seated, and may give rise to great disfigurement. Acne simplex may be subdivided into *acne punctata*, in which the lesions are little more than comedones, *acne papulosa*, in which the

Fig. 767.—Acne vulgaris.

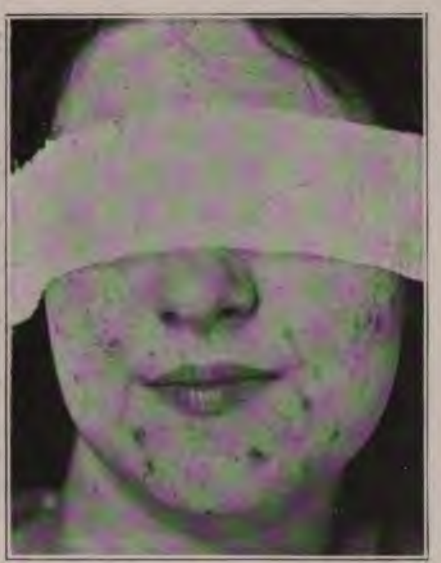

Fig. 768.—Acne excorée des jeunes filles.

inflammatory process is more marked, and *acne pustulosa*, in which superficial pustulation is present. The amount of resultant scarring varies greatly in different individuals, even though the clinical types of the disease may be practically identical. As a rule, superficial acne lesions give rise to no scarring, but in exceptional instances, particularly if the papules or pustules be picked or irritated, small cicatrices may develop (*acne atrophica*).

In the indurated variety of the disease, the abscesses are deeply seated, and there is more or less follicular destruction, with resultant scar formation. The cicatrices may be smooth, whitish, atrophic and slightly depressed, or may be rough, irregular, hypertrophic, and ele-

vated. In the course of months or years the disfigurement in these cases may be slightly lessened, but as a rule it is permanent. **Brocq** has described a peculiar type of superficial acne (*acne excoriée des jeunes filles*) occurring in neurotic young girls, in which the patients experience an irresistible impulse to pick at and scratch the lesions. The condition is apparently related to the dermatothlasia of Fournier.

Acne Artificialis.—Artificial acne may develop as a result of either external or local causes. The ingestion of large quantities of bromides and iodides is frequently followed by the appearance of acne lesions on the usual acne areas. The eruption is probably due, as Engman and Mook and others have shown, to the irritation pro-

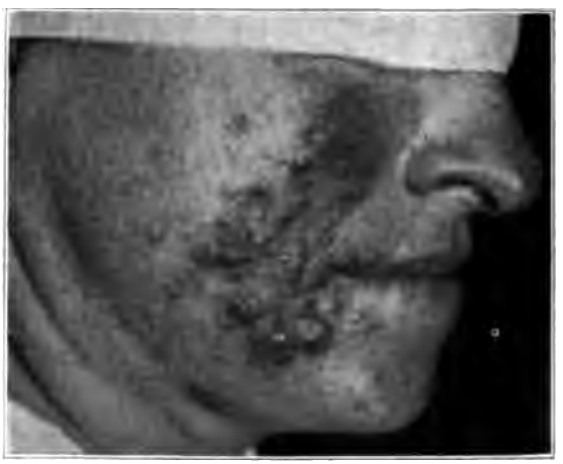

Fig. 7-9.—Acne vulgaris complicating rosacea.

duced by the drugs during the process of excretion through the sebaceous follicles. Of the various local agents that may give rise to acne, by the occlusion of the follicular orifices, tar, and oils, particularly paraffin oil, are the most common. The disorder is a not uncommon one among workers in binding-twine factories, as McEwen, Pusey, and Ormsby have shown. In this instance it is the paraffin with which the material is treated that causes the trouble. Under the designation of "*acne keratosa*," Crocker described a rare type of follicular inflammation which was characterized by the development on the face of firm, reddish nodules, the apices of which underwent suppuration and crusting. On the removal of the crust, one or several short, horny, conic plugs were found imbedded in the underlying skin, and

the lesions would not heal until these had been removed. Digestive disturbances were present in three of Crocker's four cases.

Acne cachecticorum is a variety of acne which occasionally develops in cachectic subjects, and is characterized by indolent purplish lesions on various parts of the body, usually without accompanying induration or comedo formation.

Etiology.—While it is generally conceded that the exciting cause of acne is microbic, certain predisposing factors are probably almost as essential as the presence of the infecting agent itself. Four of the most important predisposing factors are age, disorders of the ali-

Fig. 770.—Bacillus acnes, showing branching forms. High magnification. (Courtesy of Dr. T. Caspar Gilchrist.)

Fig. 771.—Bacillus acnes, showing plain forms. Very high magnification. (Courtesy of Dr. T. Caspar Gilchrist.)

mentary tract, pelvic irritation, and the conjoint presence of focal infections, particularly, infections of the tonsils and teeth. I have repeatedly seen bad cases of acne promptly recover with little or no local treatment following the removal of infected tonsils and of abscessed teeth. It is probable, as Duke has suggested, that when an individual has several infections, each may increase the severity of the others, whether due to the same or to different infecting organisms. Acne is essentially a disease of adolescence, occurring at a period when the pilosebaceous system is in an active stage of development. Any chronic condition, however, which tends to give rise to reflex flushing of

the face, follicular congestion, and atony of the skin, will finally lead to seborrhea, and the formation of comedones, and, ultimately, to the development of acne lesions. Consequently we occasionally see cases of acne in middle-aged individuals, particularly of the female sex. Sabouraud believes that a microbacillus (the bacillus acnes) is the cause of the excessive secretion, while Unna and Gilchrist hold that it is the cause of the

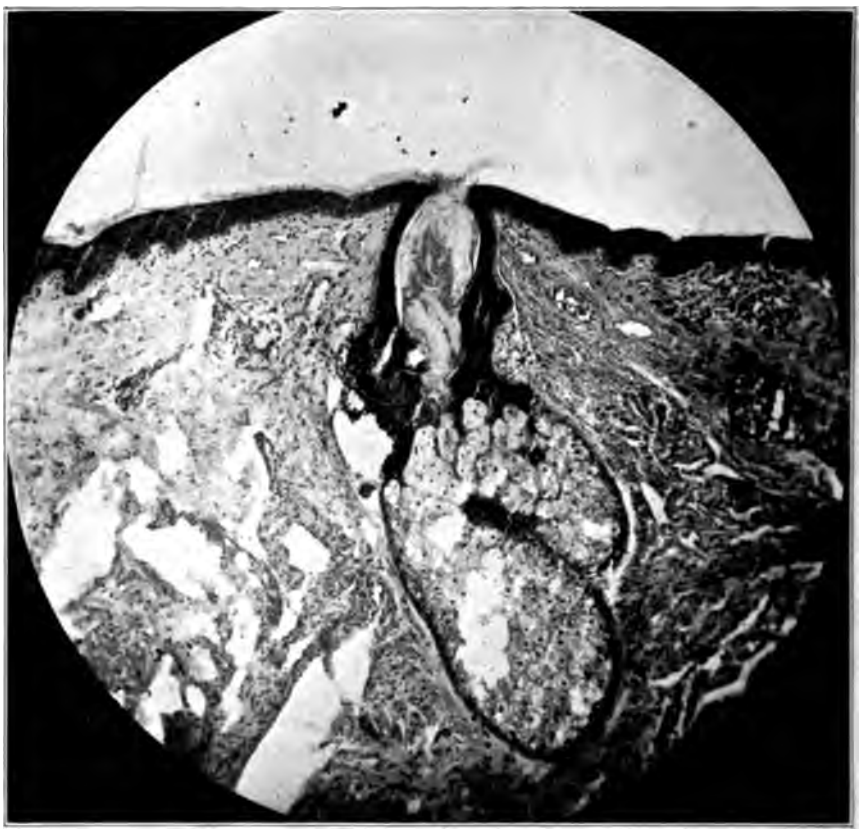

Fig. 772. Acne vulgaris, low magnification, showing comedo, and dermal changes.

comedo and the suppuration. Whitfield takes a middle view which I believe to be the most plausible of all. He believes that the seborrhea is an independent feature, and is the primary cause of the disorder. The microbacillus grows very freely in the excessive secretion, and enters the neck of the patulous follicle. Acting here either mechanically, or as a toxin, it sets up irritation, and the epithelium endeavors to deal with it in the way in which the epidermis always deals with foreign

bodies, by encysting it with horny cells. As regards the suppuration, Whitfield believes it to be due to the ordinary pyogenic staphylococci, for the following reasons; these organisms are invariably to be cultivated from the pus, smears made from the pus often show them contained within the leucocytes, thus proving that they are not mere-

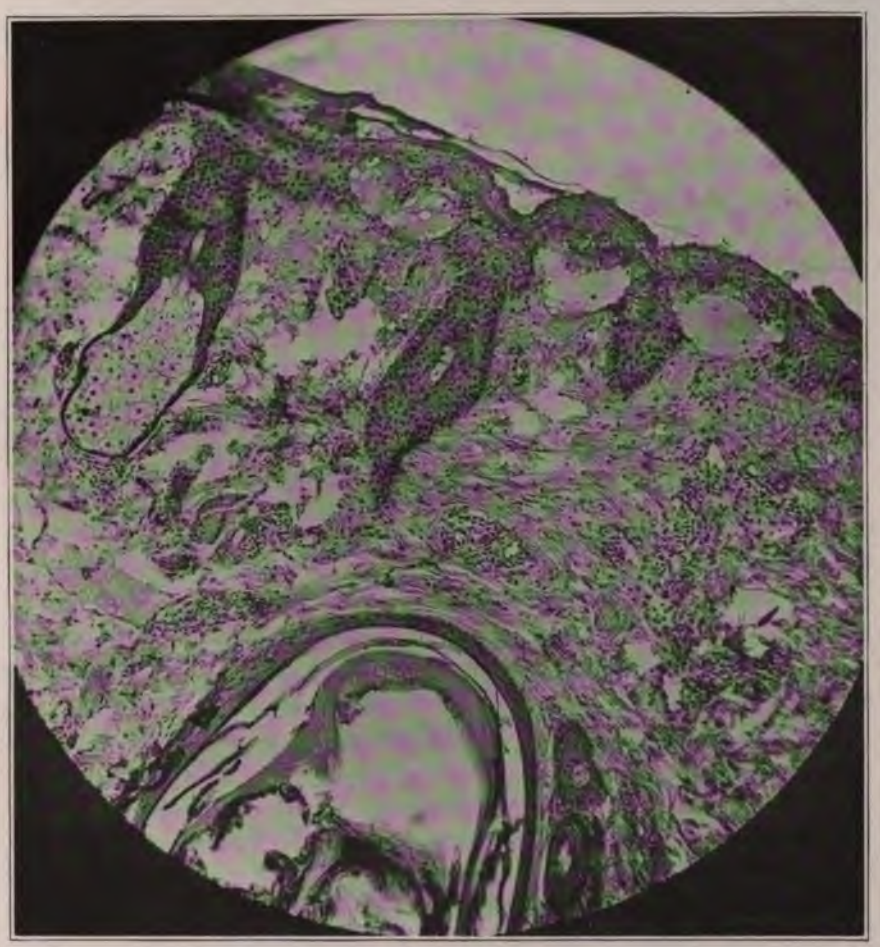

Fig. 773.—Acne excoriée des jeunes filles, showing vesicle formation around follicular opening. Moderate magnification.

ly a surface contamination, and, lastly, acne patients almost invariably show a low opsonic index to staphylococci. The bacillus acnis is a short, thick, slightly motile, non-capsulated bacillus, which stains by Gram's method, and in old cultures may develop branching forms.

Gilchrist, who has exhaustively studied the organism, has found it pathogenic to mice and guinea-pigs as well as human beings. He believes the bacillus to be highly toxic, and suggests that the constitutional symptoms so often found in acne are results rather than predisposing causes of the cutaneous affection. In 1912, Varney and Clark isolated a diplococcus from persistent acne-like lesions occurring in adults. They found that vaccines made from the organism exerted a curative effect. Dennie and I found a similar organism in a case of rebellious pustular folliculitis in a man, aged 40, in 1914. In our case the usual acne areas were not involved. Strickler, Kolmer and Schamberg have recently endeavored to prove the relationship of various organisms to the eruption in acne by means of complement-fixation tests. Almost two-thirds of the cases gave a positive complement-fixation test with the Bacillus coli obtained from the feces of acne patients, while but two-thirds of the non-acne controls reacted.

Pathology.—The pathological changes occurring in acne are of variable degree. There may be an uncomplicated hyperkeratosis at the follicle-neck, with resultant formation of small, firm, pinkish or yellowish papules. Or a simple retention cyst may be formed, as a result of occlusion of the duct. In the majority of instances, however, more or less inflammation, usually subacute in character, is present. The inflammatory process may be limited to the duct of the follicle, or it may involve one or more acini, or even the perifollicular structures. The cellular infiltrate consists of leucocytes, plasma cells, mast cells, and new connective tissue cells, lymphoid cells and giant cells. In some instances both the gland and the contiguous follicle may be entirely destroyed.

Diagnosis.—The disorder sometimes bears a superficial resemblance to the papulopustular syphiloderm and to variola. The localization of the lesions in acne, however, together with their follicular character, the associated comedones, the age of the patient, and the history of the affection will generally suffice for recognition. In syphilis the cutaneous eruption is usually accompanied by enlargement of the lymphnodes, mucous patches, and a positive serum reaction, and variola is characterized by the presence of marked symptoms of constitutional involvement, with lesions on the palms and soles as well as other parts of the body. Drug eruptions, particularly those following the ingestion of bromides and iodides, are liable at times to be mistaken for true acne.

Prognosis.—Acne is often a rebellious and obstinate disorder, prone

to relapses and recurrences. Perseverance in treatment is usually followed by a permanent cure, however, in the course of from three to twelve months. If untreated, the malady may disappear spontaneously after adult age is reached, but a considerable percentage of neglected cases persist well into middle life. In cases of the indurated type, and occasionally in those of the superficial variety. more or less permanent scarring in some instances is unavoidable.

Treatment.—Systemic treatment is essential in some cases of acne, local treatment in all. As previously stated, digestive disturbances, constipation, and pelvic irritation, particularly such as accompanies menstrual disturbances, constitute the most important predisposing factors. Careful and thorough search should always be made for any associated focal infection that may be present; and, if discovered, it should promptly be removed, before local treatment is instituted. Consequently, each case should be carefully studied, and every possible causative element eliminated, if possible. Of the various hygienic measures, those calculated to increase the tone of the skin are particularly valuable, and of these none is more valuable than daily bathing of the parts with water as hot as can comfortably be borne, to be immediately followed by liberal applications of cold water. Afterward a rough towel should be used for drying the skin. In cases presenting manifestations of utero-ovarian disturbance, the patient should be examined by a competent gynecologist before treatment for acne is instituted. The bowels should be carefully regulated and laxatives employed if necessary. Of these, the best are the cascara preparations, in the form of Hinkle's pills or the old-fashioned fluid extract. Salines are beneficial in some instances, and particularly in corpulent, full-blooded individuals, but it is unwise to place an emaciated, anemic patient on purgatives of this character as a routine measure. A combination which admirably serves the purposes of both laxative and hematinic is Startin's "mistura ferri acidi." It consists of 2 ounces (60.0) of magnesium sulphate, 7 to 15 grains (0.5 to 1.0) of iron sulphate, and 2 to 4 drams (7.5 to 15.0) of dilute sulphuric acid, in peppermint water sufficient to make 8 ounces (240.0). The dose is a dessert- to a tablespoonful, to be taken, with a little water, one-half hour before breakfast. Tonics, as iron, quinine and strychnine, arsenic, and similar agents may be employed if necessary to meet rational indications. Of the various preparations of arsenic, Fowler's solution, or a combination of iron and arsenic in a modified Blaud's pill, may be employed. Arsenic sulphide has proved worse

than useless in my hands, and calcium sulphide likewise has been without value. If it is desirable to employ sulphur as a laxative, ordinary precipitated sulphur is to be preferred. The diet should be nutritious, and plentiful in amount, but only simple and easily digestible foods should be taken. Plain meats, particularly steaks and chicken, seldom if ever prove harmful. Of the various articles that are to be avoided, pork, sausage, cheese, pickles, pastries, large amounts of sweets, cocoa, and chocolate are the principal ones. Coffee, tea, and all alcoholic beverages are injurious as a rule. Milk, especially buttermilk, and plentiful amounts of water, either cold or hot, are to be recommended.

Vaccines.—Vaccine therapy probably has been more widely employed in the treatment of acne than in any other disease. In the majority of instances the results have proved disappointing, largely owing to the employment of stock vaccines, and incorrect dosage. Both Gilchrist and Engman, who have had wide experience in the treatment of this disorder with vaccines, recommend autogenous preparations of the bacillus acnes, in comparatively small doses, from 3 to 10 million, to be repeated at intervals of from five to eight days (during the stage of depression, marked by the appearance of new lesions). Frank J. Hall recommends an initial dose of 5 million, to be repeated at 2 to 5 day intervals, the amount being gradually increased to 100 million, if necessary. In my experience bacterins of all kinds have proved extremely disappointing, and I have practically abandoned their use in this disease.

Local Treatment.—The successful eradication of the lesions is largely dependent upon the employment of local remedial agents. The first object is to get rid of the products of suppuration, and to sterilize, as far as possible, the affected skin. After thorough bathing of the parts in water as hot as can comfortably be borne, any existing comedones should be removed by means of a suitable extractor, and all abscesses incised and drained. George H. Fox strongly advocates the use of the dull curette. Following these procedures, ablutions of hot water, or better, hot lysol solution (1 per cent) should again be resorted to, the skin dried, and the selected medicament applied. Should the skin be actively inflamed at the time of consultation, soothing agents as calamine lotion, or zinc oil, may be prescribed. As a rule, however, it is best to go direct to the more stimulating preparations. In choosing these, it is well to bear in mind the indications which are to be met. In addition to stimulating and antiseptic properties, the agent should serve as a keratolytic and an astringent. The two drugs which

come the nearest to supplying these qualities are sulphur and resorcin, and of these sulphur is the more reliable. It may be employed in the form of a lotion, a powder, or an ointment. An excellent plan is to employ a sulphur lotion, as "lotio alba," at night, and a powder during the day. "Lotio alba" consists of zinc sulphate and fresh potassium sulphuret, of each from 30 grains to 4 drams (2.0 to 16.0), in 4 ounces (120.0) of rose water. After bathing the affected area, the lotion is applied freely, and allowed to remain on over night. The following morning, the skin is again bathed, Rainier soap or hand sapolio being employed if there is much corneous hypertrophy, and a powder consisting of sulphur, 1 dram (4.0), and talc, 1 ounce (30.0), dusted freely over the surface. At the end of a few days the skin generally becomes very harsh and rough, and the sulphur preparations may be replaced by calamine lotion, for use during the day, and liberal applications of cold cream at night. Later, recourse may again be had to the more irritant remedies. Occasionally, green soap, or tincture of green soap, is preferable to the ones suggested, and in stubborn, obstinate cases Vleminckx's solution is more efficient than the milder sulphur lotion. Resorcin is best employed in alcoholic solutions, and may be prescribed in strengths of from 2 to 10 per cent. Sulphur ointments, consisting of precipitated sulphur or hypochloride of sulphur (10 to 20 per cent) in benzoinated lard, sometimes act well, but many patients object to the employment of greasy agents. Occasionally, and particularly in the more acute, superficial types of acne, aqueous solutions of bichloride of mercury (1 to 1,000) serve admirably. Ammoniated mercurial ointment likewise proves valuable at times. In severe, sluggish types of the disease, a "shelling paste" may be employed, to be followed by soothing applications until all irritation has subsided, when the paste may be reapplied. Either resorcin (20 per cent), or betanaphthol (10 per cent), in zinc oxide or rosewater ointment, may be used, and Lassar supplements the latter by the addition of green soap and precipitated sulphur.

Radiotherapy.—Radiotherapy properly employed at present constitutes one of the most valuable remedies we possess in the treatment of this disease. As Pusey has pointed out, the rationale of its use depends upon the fact that by exposures to the x-rays the functional activity of the sebaceous glands can be greatly diminished, and on account of the consequent diminution in size of the follicles, the pores become small, and the texture of the skin much improved. The skin should be kept as free as possible from irritation by means of soothing lotions. Brief exposures are given, two or three times per week,

a soft tube, at about 15 cm. distance, being employed. The hair, eyebrows and lips should be protected by heavy lead foil, and care must be exercised to guard against over-exposure and resultant permanent injury.

Repeated exposures to ultra-violet light (Kromayer, or Alpine Sun Lamp) often prove highly beneficial.

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ACNE ROSACEA.

Synonyms.—Rosacea; Rosacea seborrhoica; Acne erythematosa; Gutta rosacea; Toper's nose.

Definition.—A chronic disorder of the skin of the nose and the flush areas of the face, characterized by congestion and telangiectasis, and frequently accompanied by seborrhea and acne.

Symptoms.—In the majority of instances the affection is of angioneurotic origin, and in its earlier stages is characterized by slight, diffuse redness of the tip of the nose, together with appreciable lowering in temperature of the part. As a result of the persistent congestion, the sebaceous glands become hyper-active, and seborrhea results. The follicles are dilated and patulous, and the surface of the affected skin is greasy and shiny. The superficial capillaries become dilated, and can be seen as tortuous, red, thread-like channels, lying just beneath the epidermis in the region of the alae and nasolabial folds. Ultimately, if the process continues, the contiguous areas on the cheeks are involved, and, in extreme instances, the affection may extend to the forehead and chin. In the course of time the manifestations become more obvious, and the affected area assumes a dull-reddish or purplish hue. The skin becomes thickened and rugose, and the gaping follicular orifices more

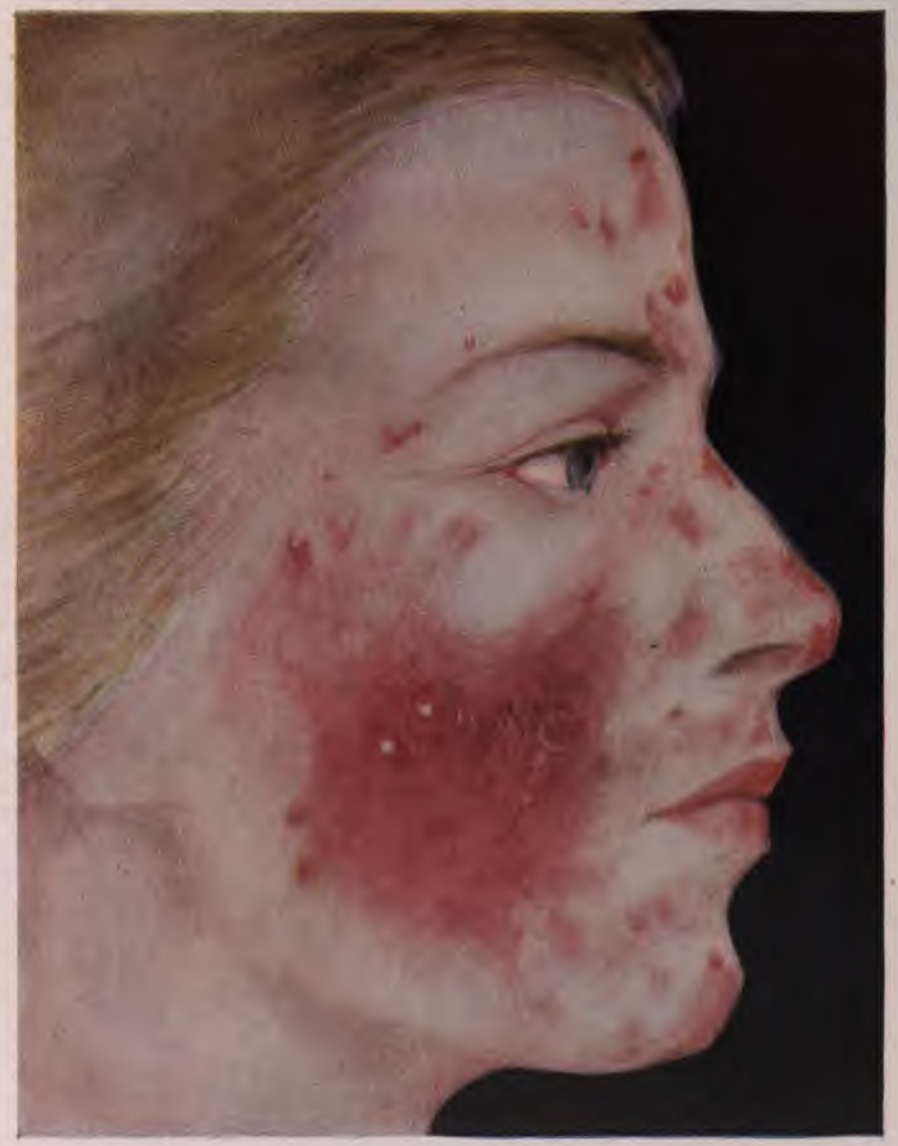

PLATE X.

Rosacea.

sieve-like, and numerous acne lesions crop up to further complicate the clinical picture. Occasionally, as in the cases reported by Schamberg and others, there is an associated keratitis. Owing to the long continued congestion, hypertrophic changes may supervene, and the tip of the nose converted into a firm, reddish or purplish, lobulated, pendulous, mass *(rhinophyma)*. Subjective symptoms are absent.

Etiology.—The malady may develop as a result of any disorder which gives rise to persistent reflex flushing of the face. The milder grades of the condition are commoner in women, as a result of thyroid and utero-ovarian disturbance, dyspepsia, constipation, and

Fig. 774.—Rhinophyma.

the use of strong tea and coffee. The severer grades are restricted almost entirely to men, and in many instances, but by no means invariably, the habitual use of alcohol is the essential cause. As Whitfield states, this agent owes its peculiar efficiency in causing acne rosacea to the fact that when taken in excess, it damages the alimentary canal and also causes dilatation of the cutaneous blood vessels. Local vascular disturbances, such as may result from obstruction due to intranasal pressure, engorged turbinates, and even hypertrophied tonsils are an occasional factor, and in one instance I have seen prompt recovery follow the removal of a large mass of pharyngeal adenoids. Local inflammatory disorders also play an important part in the causation at times, and in every case the nares should be carefully examined for evidence of an ex-

isting folliculitis. Seborrhea, acne, and seborrheic dermatitis are frequent coincident affections, and undoubtedly serve as contributory factors in a certain percentage of cases. Uncleanliness, and exposure to sun and wind likewise are important secondary factors at times. Histologically, the blood vessels are dilated, and there is an associated hyperplasia of the surrounding connective tissue. The sebaceous glands are hypertrophied, and may undergo various degenerative changes. The acne lesions are practically identical with those found in the ordinary type of the disease.

Diagnosis.—Acne rosacea is to be differentiated from acne, the tubercular syphiloderm, eczema, lupus vulgaris, and lupus erythematosus. The age of the patient, the localization and course of the lesions, their symmetric arrangement, and the absence of oozing, itching, and ulceration, together with the lack of subjective symptoms, should serve to exclude these disorders.

Prognosis.—The favorableness of the outlook is largely dependent upon the removability of the underlying causative factors. As a rule the disorder is amenable to treatment, but difficult to cure.

Treatment.—The nose should be carefully examined internally as well as externally, and if found abnormal or diseased the patient should promptly be referred to a competent nose and throat specialist. After the nasal condition has been remedied, the treatment of the cutaneous disorder may be undertaken. Digestive disorders, if present, should receive proper attention, and the bowels, in particular, carefully regulated. Hyperthyroidism should be discovered or excluded. Alcohol, coffee, strong tea, pork, sausage, highly spiced foods, cheese, pastries, tomatoes, and hot drinks are to be avoided. In women the menstrual function should be inquired into, and, if found abnormal, a gynecologist should be consulted. Of the various local measures, radiotherapy is the most reliable. The telangiectases can best be eradicated by means of electrolysis. Otherwise the treatment is essentially the same as that of acne (q.v.), reliance being placed mainly on sulphur and resorcin lotions. In the milder degrees of connective-tissue hyperplasia, either multiple scarification or electrolytic punctures often do good, but in advanced cases of rhinophyma resort must be had to more drastic measures. The best plan is to pare off the lesions under general anesthesia. The wounds usually heal promptly, and with remarkably slight scarring.

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ACNE VARIOLIFORMIS.

Synonyms.—Tuberculide; Acne necrotica; Necrotic granuloma; Acne frontalis; Acne atrophica.

Definition.—A chronic, inflammatory disorder characterized by the development of a few or several reddish or brownish, papulopustular lesions, which frequently involve the follicles, and are always followed by more or less variola-like scarring.

Symptoms.—The disease is a comparatively rare one, and the two

Fig. 775.—Acne varioliformis, of eight years' duration.

sexes are about equally affected. The majority of the patients are adults. The lesions are discrete or grouped, pinhead- to pea-sized or larger, slightly elevated, pale-reddish papules or nodules, which develop slowly, and which ultimately undergo central necrosis and occasionally pustulation, with the formation of brownish, tightly adherent crusts. The majority of the papules are pierced by hairs, and a coincident seborrhea is not infrequent. In the course of a few days, to a fortnight, the crust becomes detached, and a small, rounded, variola-like scar is exposed. In those instances presenting a tendency to grouping, linear or circinate patches may result. The scalp, forehead, nose, and cheeks are favorite sites, although in rare instances the trunk, and even the extremities, may be involved. Subjective symptoms are usually lacking. The course of the disease is persist-

ent, and as a result of frequent development of new lesions, an attack may continue over a period of months or even years.

Etiology.—Aside from the fact that the majority of observers believe the disorder to be microbic in origin, little is definitely known concerning its causation. Stelwagon and Johnston consider it a tuberculide, and Sabouraud holds that it is due to the conjoint action of his microbacillus and ordinary staphylococci, while other investigators ascribe the lesion wholly to the action of these latter organisms. Schamberg has found Sabouraud's bacillus on apparently normal skin, and Engman and Mook have successfully treated the disease with staphylococcus vaccine, consequently it is very possible that the presence of Sabouraud's organism is accidental, and that certain strains of the staphylococcus constitute the sole causative factor. Histologically, the lesions are commonly, but not invariably, follicular (Pick), and are characterized by localized foci of dense round-cell infiltration in the upper derma, usually surrounding a follicle, with subsequent necrosis, and sloughing en masse of the overlying epidermis. The coil glands and ducts are involved only by accident, and the inflammatory process is much more superficial than in hidradenitis suppurativa.

Diagnosis.—The disease is to be distinguished from acne vulgaris and the pustular syphiloderm. The localization and paucity of the lesions, and the peculiar character of the scarring should serve to prevent confusion with the former, and the absence of other signs of lues should eliminate the latter.

Prognosis and Treatment.—Untreated, the disease may persist indefinitely, and even when properly treated relapses and recurrences are common. Internally, measures looking to the improvement of the patient's resistance to infection are indicated. Engman and Mook found staphylococcus vaccine serviceable in combating the disorder. The condition of one of White's patients was greatly benefited by large doses of Fowler's solution. Of the various applications, ointments containing ammoniated mercury, or sulphur and naphthol (Fordyce) are probably the best. In the hairy regions, lotions containing biehloride, resorcin, or euresol should be employed.

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3. DISEASES OF THE COIL GLANDS.

HYPERIDROSIS.

Synonyms.—Polyidrosis; Excessive sweating.

Definition.—A functional disorder of the coil glands characterized by excessive production of sweat.

The affection may be symptomatic or idiopathic, acute or chronic, generalized or circumscribed.

Symptoms.—Symptomatic hyperidrosis is of common occurrence in certain systemic disorders, particularly pulmonary tuberculosis, Graves' disease, certain types of rheumatism, and malaria. It is for

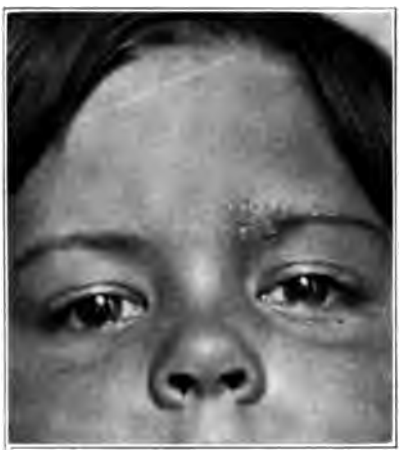

Fig. 776.—Hyperidrosis circumscripta. The affected area was less than 5 cm. in diameter.

relief from the idiopathic, and more or less localized types of the disorder, however, that the dermatologist is usually consulted. General hyperidrosis is variable in degree, and is a not uncommon affection in highly nervous individuals. The sweating is nearly always greatest in the regions normally rich in coil glands, and may be so excessive at times as to produce physical exhaustion and even death (Myrtle, Richardson). Localized idiopathic hyperidrosis is an extremely interesting phenomenon. The involved areas vary greatly in size and distribution. A lateral half of the face, or even of the entire body may be affected, as in the cases reported by Teuschler and others, or the upper or lower half of the trunk, as in instances recorded by Kaposi and by Mackenzie. As a rule, the hyperactivity is confined

to the glands located in certain nerve areas. I once had under my care a young boy in which the disorder was limited to a small area, about 5 centimeters in diameter, near the inner extremity of the left eyebrow. More recently, I have observed an instance in which a palm-sized area in the left scapular region was affected. The patient was a male laborer, an Italian by birth, who for many years had been a typical neurasthenic. In moments of excitement, during even cold weather, the sweat would ooze out upon the surface in such quantity that a teaspoonful could be collected in the course of four or five minutes.

The commonest of all clinical types of hyperidrosis are the local forms which involve the palms and soles, alone or conjointly. The affection is usually symmetric, and the excessive sweating may be

Fig. 777.—Hyperidrosis circumscripta. The moist area is covered with adherent particles of lead-pencil dust.

continuous or intermittent, and is aggravated by depressed states of the general health, emotional disturbances, exhaustion, and hot weather. The parts are usually cold and clammy to the touch. The affected skin may become thickened, erythematous, sodden, and tender. The axillae are occasionally involved, and the genital region also is a not infrequent site. As a result of maceration of the corneous layer, and the irritation arising from contact with the decomposed sweat, the skin may become inflamed and eczematous.

Etiology and Pathology.—Both sexes and all ages are susceptible to the disorder. The influence of the nervous system on the secretory function of the coil glands has long been recognized (Claude Bernard, Brown-Séquard, S. Weir Mitchell), but the exact manner in which the stimulation is applied is still an unsettled question. Fränkel, Campbell, and Jamieson have found organic changes in the cervical ganglia

and the cerebral cortex in cases of unilateral sweating. Wende and Busch, Parounagian, and others have reported instances of localized sweating which were evidently induced reflexly through stimulation of the olfactory and gustatory nerves.

The presence of certain debilitating diseases undoubtedly increases the tendency to hyperidrosis in some instances, and Hutchinson and others have shown that the use of stimulants, such as strong tea, alcohol, and even excessive amounts of tobacco likewise serve at times as contributory factors. Neurasthenics, and extremely nervous and excitable individuals are particularly susceptible to the disorder. Limited areas of excessive sweating are occasionally noted as a result of malarial infections. Lesser, Morris, and, more recently, Hardaway and Allison, have called attention to the fact that malpositions of the feet, especially flat-foot, is in many instances responsible for hyperidrosis pedum.

Robinson examined a number of sections from the palm of the hand and failed to detect anything abnormal in the size of the glands or in the appearance of the glandular epithelium. Virchow found the glands enlarged and the epithelium in a state of fatty degeneration in cases of hyperidrosis in connection with pulmonary tuberculosis. In the Italian's case, which is here reported, I examined a number of specimens excised from the affected area as well as from the corresponding normal area in the right subscapular region. In many instances the coils were greatly hypertrophied, and there were present signs of active cellular proliferation in the secretory zone. The blood vessels also were increased in size.

Prognosis.—In symptomatic hyperidrosis, the outlook is largely dependent upon the successful removal of the underlying systemic disturbance. In the idiopathic cases, and particularly in the circumscribed forms, some improvement can usually be safely promised, but the prognosis should never be too optimistic.

Treatment.—In universal hyperidrosis of symptomatic origin the treatment is to be directed toward the removal of the underlying cause. In the idiopathic forms, various empirical remedies have been suggested. Iron, arsenic, quinine, ergot, belladonna, and atropine (the two latter should be employed with circumscription), are probably the best. In the majority of instances, however, the main reliance is to be placed on local applications. Of these, the mild astringents, such as weak aqueous solutions of alum, tannic acid, and zinc sulphate, are probably the most valuable, although, acting on the

advice of Pusey, I have found a 1 per cent solution of formalin, in water, or in equal parts of water and alcohol, a very satisfactory remedy. The liquid is to be freely applied for several minutes, the part then dried, and afterward powdered with boric acid, to which a small percentage (1 or 2 per cent) of salicylic acid has previously been added. Hebra's diachylon-ointment method is a favorite with many, and Stelwagon strongly recommends a tannic acid ointment (10 to 20 per cent), made up with equal parts of suet and petrolatum. The parts should first be washed with soap and water, rinsed, and dried with a soft towel. The salve is spread on narrow strips of lint, and carefully applied to the affected areas. A bandage is employed to hold it in place. Every twenty-four hours the dressing is removed, the surplus ointment rubbed off, and a new dressing applied. At the end of a fortnight, the ointment may be discontinued, and a bland dusting powder (as boric acid) substituted. The skin usually desquamates in the course of from two to three weeks, and this is followed by temporary, and occasionally by permanent, relief from the malady. Weiss has found strong solutions of potassium permanganate valuable in combating hyperidrosis of the soles, and Davis, of Philadelphia, recommends painting the parts twice daily with an alcoholic solution of salicylic acid (12 per cent), and resorcin (12 per cent), until exfoliation occurs. A mild antiseptic dusting powder is then employed. Stillians has recently suggested the employment of a 25 per cent aqueous solution of aluminum chlorid for the relief of the condition, and in my experience the remedy has proved a valuable one. The solution is dabbed gently on the part and allowed to dry. Generally two or three applications (at intervals of twenty-four hours) will give relief for a period of several weeks. Pusey speaks highly of radiotherapy in the treatment of this disorder, and MacKee likewise has employed the x-rays with satisfaction. My experience with this agent in the treatment of hyperidrosis now covers a considerable number of cases, and extends over a period of several years, and I must acknowledge that the remedy is by far the most efficient and dependable of any that I have ever seen tried. It must be employed skilfully, and with caution, however, or the results will be disastrous, and anyone who has ever been so unfortunate as to cause a radiodermatitis of even mild degree in the palmar or plantar regions will not care for a repetition of the experience. Mild exposures should be given, at bi-weekly intervals, until the activity of the coil glands has been inhibited to a sufficient degree. In obstinate

cases the patient may have to return occasionally for further treatment, but as a rule the results are extremely gratifying.

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ANIDROSIS.

Synonym.—Anhidrosis.

Definition.—A functional disturbance of the coil glands characterized by diminished production of sweat.

Symptoms.—The disorder is occasionally congenital, and may be generalized, as in ichthyosis, or localized, in certain areas, as in scleroderma, erysipelas, anesthetic leprosy, and certain of the graver nervous affections. The condition may be of temporary or permanent duration. It rarely if ever occurs as an idiopathic cutaneous malady. Normally, the sweat secretion serves to help keep the skin moist, soft, and pliable, and as a result of the diminished lubrication the affected areas become dry, harsh, rough, and extremely susceptible to external irritants. Owing to this increased vulnerability, pruritus, dermatitis and eczema are frequent complications of anidrosis.

Treatment.—In the symptomatic types, temporary relief can usually be secured by means of pilocarpine, and hot drinks. In the generalized forms, as in ichthyosis, the best that can be hoped for is temporary alleviation. The wearing of soft, warm clothing, and the daily application of bland, soothing ointments and lubricants, as cocoa butter, will serve to protect the skin.

BROMIDROSIS.

Synonyms.—Bromhidrosis; Fetid or offensive sweat; Osmidrosis.

Definition.—Sweat secretion of an offensive odor, due to functional disturbance of the coil glands, or to alteration of the sweat after its excretion. The disorder may be general or local, and is usually associated with hyperidrosis.

Symptoms.—The odor of the perspiration of every individual is more or less characteristic. The sweat of certain races is noticeably more odorous than that of others. Generalized bromidrosis of pathological origin is rare. As a rule the affected areas are limited in extent, and of symmetric distribution. The axillae, genitocrural regions, and the feet are the regions commonly involved. The secretion may be excessive, although not necessarily so. The odor varies. It may be pleasant and agreeable, as in the cases described by Hammond, but as a rule it is penetrating, sickening, and persistent, and resembles that emitted by putrid cheese. In addition to the excessive production of sweat usually present, the skin may exhibit slight redness or tenderness, or other manifestations of irritation or inflammation.

Etiology and Pathology.—The disorder may be symptomatic or idiopathic. It may be due to the vicarious excretion of urea, or to the presence of asafetida, garlic, musk, copaiba, or other odoriferous substances in the sweat. In the instances reported by Hammond, the patients were suffering from nervous disorders, and the perspiration had a violet- or pineapple-like odor. Many of the localized forms of bromidrosis are due to decomposition of the sweat after excretion, or as a result of contamination with the bacterium fœtidum (Thin). It is probable that chemical decomposition of the excreted fluid also plays an important part, as the odor is most marked in those cases in which the sweat is not allowed to evaporate promptly.

Treatment.—Excessive sweating, if present, may be controlled by x-rays. The parts are to be kept clean by frequent bathing, the use of an antiseptic, as formalin, potassium permanganate or bichloride of mercury, and daily changes of clothing. If the feet are the parts affected, resort may be had to a powder composed of tannoform, 1 part, and talcum, 2 parts. Or boric acid, alone or mixed with salicylic acid (2 to 5 per cent), may be employed. An occasional painting with an aqueous solution of chromic acid (2 to 5 per cent) frequently proves beneficial, and in the German army an ointment composed of salicylic acid (2 per cent), in mutton tallow, is often employed as a prophylactic.

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CHROMIDROSIS.

Synonyms.—Colored sweat; Stearrhœa nigricans.

Definition.—An affection characterized by the excretion of colored sweat.

True chromidrosis is an extremely rare disorder, although cases undoubtedly do occur. In the vast majority of instances, however, the color is due to the presence of chromatogenous micro-organisms, and of various tinctorial substances on the surface of the skin *(pseudochromidrosis)*.

Symptoms.—The condition is usually localized, the eyelids, breasts, axillae, and genitocrural regions being favorite sites. Occasionally the hands or limbs may be affected. In J. C. White's case the malady involved the trunk, and was of unilateral distribution. In the idiopathic cases the discoloration is usually brownish, grayish, bluish, or violaceous. The secretion commonly collects slowly on the skin, and imparts to the affected areas a greasy, powdery appearance, not unlike that resulting from the application of small amounts of lead pencil dust to a seborrheal surface (Mitchell). The pigment is mixed with grease, and while only slightly soluble in water, can be readily removed with the aid of benzine or ether. The other excretions, particularly the urine and the milk, likewise may be affected.

Etiology and Pathology.—The majority of the reported cases have occurred in nervous, excitable women. Menstrual disturbance is apparently a factor in some instances (Barié). Both Maricourt and Mitchell believe that seaside residence occasionally bears a causal relationship. The ingestion or absorption by contact or inhalation of certain substances, as potassium iodide, copper, and the iron salts, may give rise to the condition. It is exceedingly probable that pigment is excreted by the sebaceous as well as the coil glands at times, consequently the term "seborrhœa nigricans" is not such an inappropriate one after all. The exact chemical nature of the pigment in the idiopathic cases is unknown. In Heidingsfeld's case the disorder was apparently an anomaly of pigmentation, rather than an alteration of glandular secretion.

Diagnosis.—The affection is to be differentiated from pseudochromidrosis, a disorder which is usually confined to the hairy regions, particularly the axillae and pubes, and in which the color changes are produced after the sweat reaches the surface.

Prognosis and Treatment.—The disorder is an obstinate and per-

sistent one, and tends to recur even after apparent cure. Treatment is to be directed to the relief of the underlying nervous affection. In pseudochromidrosis, cleanliness, and the daily use of weak solutions of formalin or a similar antiseptic, will bring about a cure.

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HEMATIDROSIS.

Synonyms.—Bloody sweat; Sudor sanguinosus; Hemidrosis.

Hematidrosis is an extremely rare disorder characterized by excretion of blood or blood pigment through the coil glands, and is usually a manifestation of purpura. The majority of the reported examples have occurred in the newborn and in highly emotional or hysterical subjects. The disorder may involve limited areas on the face, ears, umbilicus, or limbs, and the discharge may be preceded or accompanied by pain of a neuralgic character. At times the condition is associated with other bleeding stigmata, vicarious menstruation, and similar conditions. Scott has recently reported a suggestive case. Török found red-cells in the lumen of a coil gland, and it is possible, as Crocker has suggested, that the condition is secondary to a purpura of the sweat coils. Aside from the measures directed to the relief of the underlying malady, the treatment is symptomatic.

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HEMATIDROSIS.—*Scott,* Brit. Med. Jour., 1918, i, p. 532.

URIDROSIS.

Synonyms.—Urinous sweat; Urinidrosis.

Uridrosis is a term employed to denote the excretion of sweat containing abnormal quantities of urinous elements, particularly urea. The small percentage of urea normally occurring in the coil-gland excretion is increased in cholera and in some other systemic disorders, and is an especially prominent manifestation in certain varieties of nephritis. The amount of urinous salts thrown off by the skin glands is markedly increased following the administration of pilocarpine. After the evaporation of the fluid constituents, the excreted material

Fig. 778.—Uridrosis. (Courtesy of Dr. H. H. Hazen.)

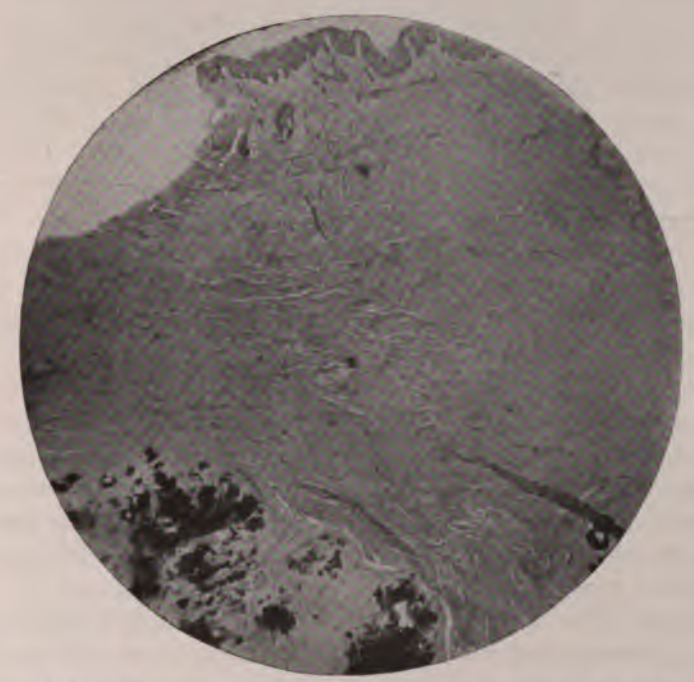

Fig. 779.—Uratic deposits in skin. (Courtesy of Dr. Frederick G. Harris.)

appears on the surface as a hoar-frost-like coating, consisting of whitish crystals and irregular powdery masses.

True phosphoridrosis is extremely rare. Its occurrence has been noted in malaria, cancer of the breast, and pulmonary tuberculosis, and following the ingestion of certain varieties of fish. Beyerinck has succeeded in isolating several species of photobacteria from fish, and it is possible that the phosphorescence in some instances is due to the presence of organisms of this kind.

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SUDAMEN.

Synonym.—Miliaria crystallina.

Definition.—A non-inflammatory disorder of the coil glands, characterized by an abundant eruption of pinpoint- to pinhead-sized or larger, superficial, thin-walled, translucent, pearl-like vesicles.

Symptoms.—The lesions are whitish in color, and closely set, but do not coalesce. They seldom rupture spontaneously, but usually persist for a few days and then disappear by absorption. The site of predilection is the trunk, particularly the anterior surface, although other parts of the body may be involved. In rare instances the distribution is more or less generalized. The duration of an individual lesion varies from three days to one week, but an attack is usually prolonged by the development of new vesicles. The eruption gives rise to no subjective symptoms.

Etiology and Pathology.—The disorder is a result of excessive sweating, and may develop in the course of any malady which is characterized by hyperpyrexia. Histologically, the vesicles are confined to the outer layers of the stratum corneum, and lie in the course of a coil gland duct. Robinson has shown that the contents consist of sweat. A wholly satisfactory explanation for the occlusion or obstruction of the orifice of the duct is yet to be supplied.

Diagnosis.—The disorder is to be differentiated from miliaria, vesicular eczema, and varicella. The character and course of the eruption, its appearance following excessive sweating, and the total absence of inflammatory manifestations will usually serve for recognition.

Treatment.—The eruption is self-limited, and requires little treat-

ment. Daily sponging with alcohol, and the liberal application of a bland dusting powder, as zinc stearate, will hasten recovery.

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HYDROCYSTOMA.

Synonyms.—Hidrocystoma; Cyst of the coil gland duct; Dysidrosis of the face; Sudamen of the face.

Definition.—A disorder characterized by discrete, tense, deep-seated, non-inflammatory vesicles on the face and forehead.

Symptoms.—The malady is rather an unusual one, and was first described by Robinson, in 1882. The lesions are thick-walled, pinhead- to pea-sized, rounded or oval, translucent vesicles, the cen-

Fig. 780.—Hydrocystoma.

tral areas of which are darker than the margins. The face, particularly the lateral surfaces of the nose, the flush areas of the cheeks, and the forehead are the regions commonly involved. The vesicles are deeply seated, and never rupture spontaneously. There are no accompanying signs of inflammation. In the course of a few weeks or months the lesions undergo desiccation, leaving no trace. The disorder generally develops during the summer months, and may recur each season for several years. Persons who are subject to hyperidrosis of the face are more susceptible than normal individuals. Subjective symptoms are slight or entirely lacking.

Etiology and Pathology.—The majority of the reported cases have occurred in middle-aged or older women, especially in laundresses. I have encountered two typical instances of the affection in young, and otherwise healthy, Kansas farmers. Exposure to moist heat is probably causative, or at least aggravative, in many instances. The cyst-like for-

mation is a result of dilatation, and is usually located in the lower part of the corium, just above the gland. The duct is enormously distended, and filled with fluid (retained sweat). The cavity is lined with flattened epithelial cells.

Diagnosis.—The localization, character, distribution and history of the lesions should prevent their confusion with those of sudamen, vesicular eczema, and pompholyx.

Prognosis and Treatment.—The avoidance of exposure to heat, particularly moist heat, will often prevent the development of the con-

Fig. 781.—Hydrocystoma. Low magnification.

dition. The lesions may be punctured and drained, and a soothing application, such as calamine lotion, prescribed.

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MILIARIA.

Synonyms.—Miliaria rubra; Prickly heat; Heat rash; Red gum; Lichen tropicus.

Definition.—An acute, inflammatory disorder of the coil glands,

characterized by the sudden appearance of numerous pinpoint- to pinhead-sized papules and vesicles, accompanied by sensations of itching and burning.

Symptoms.—The malady usually develops in hot weather, and is especially common in tropical countries. Individuals who habitually sweat profusely are particularly susceptible to the affection. The lesions may be papular, papulovesicular, or vesicular, and while they may be closely crowded together, never coalesce. At first they are usually surrounded by pinkish areolae (miliaria rubra), but later they become pale and whitish or yellowish-white in color (miliaria alba). Ultimately the papules regress, and the contents of the vesicles undergo desiccation and desquamation or, rarely, a few become infected with staphylococci, and form minute abscesses. The eruption may be of more or less generalized distribution, but usually it is limited to the covered parts of the body. The lesions develop quickly, and disappear, as a rule, in the course of a few days to a fortnight. As a result of irritation or friction, the affected areas may become eczematous. Pricking, burning and itching of variable degree generally are present during the course of an attack.

Etiology and Pathology.—Exposure to excessive heat, particularly moist heat, is the exciting cause of the disorder. Infancy, obesity, debility, overclothing, and a tendency to hyperidrosis,—all are predisposing factors. Indulgence in alcohol renders one especially susceptible to the malady. Robinson believes the disorder to be an inflammatory affection of the epidermis in the vicinity of the coil gland outlet, Pollitzer, a cystic dilatation of the sweat duct, due to occlusion of the orifice, and Török a superficial dermatitis, resulting from sweat irritation, but not involving the coil glands or ducts.

Diagnosis.—The history, and course of the attacks, together with the excessive sweating, the distribution and course of the lesions, and the absence of constitutional symptoms should serve to exclude eczema and the acute exanthemata.

Prognosis and Treatment.—Uncomplicated, an attack usually subsides in the course of a few days or weeks. Preventive measures consist in guarding against exposure to excessive heat, the wearing of too much clothing, or the use of alcohol. Mild astringent lotions, as dilute aqueous solutions of aluminum acetate, vinegar, resorcin or alcohol usually prove helpful, particularly when their use is supplemented by liberal applications of a bland dusting powder, as boric acid, zinc stearate, or a mixture of boric acid (50 parts), starch (48 parts), and salicylic acid (2 parts). Anderson's antipruritic powder,

which is composed of powdered camphor (1 part), zinc oxide (4 parts), and starch (16 parts), likewise is extremely valuable in some instances.

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GRANULOSIS RUBRA NASI.

Synonyms.—Dermatitis micropapulosa erythematosa hyperidrotica nasi; Perisyringitis chronica nasi.

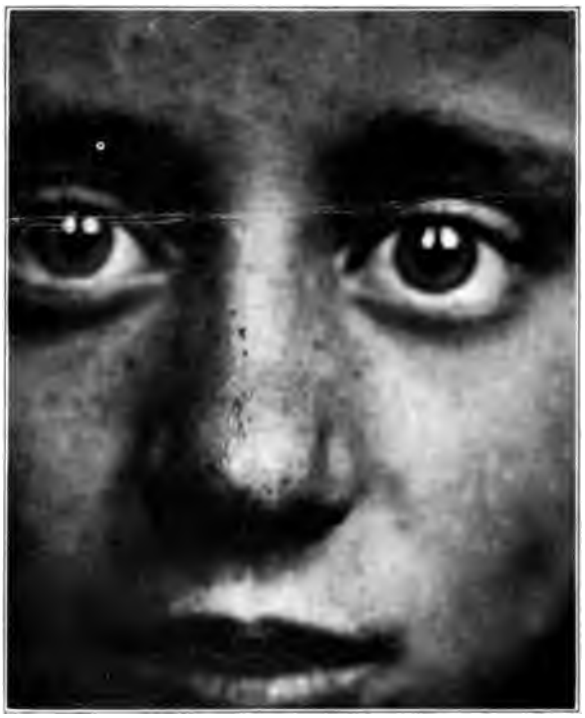

Fig. 782.—Granulosis rubra nasi. (Courtesy of Dr. J. E. Lane.)

Definition.—A chronic inflammatory disease of the skin in the alar regions, characterized by localized congestion and hyperidrosis and well-defined, reddish, pinpoint- to pinhead-sized macules and papules.

Symptoms.—The majority of the reported cases have occurred in delicate children. Individuals who are the subjects of impaired peripheral circulation apparently are more susceptible than others to the

disease. In some instances there is an associated hyperidrosis of the face and hands.

The lesions are irregularly arranged over the cartilaginous portion of the nose, and consist of reddish, purplish or brownish macules and maculopapules, with an occasional thick-walled, hydrocystoma-like vesicle containing clear fluid. Often a papule is tipped by a droplet of sweat. As a result of accidental infection with staphylococci, pustulation may occur. The tip of the nose is usually cold to the touch. There is no tendency to ulceration, and subjective symptoms are absent.

Etiology and Pathology.—The essential cause of the affection is unknown. Hyperidrosis apparently is a predisposing factor, and vascular disturbances likewise are usually present. A coincident hydrocystoma is not uncommon, and Pinkus believes that a relationship exists between the two maladies. Histologically, Jadassohn found inflammatory changes in the corium, particularly in the blood vessels supplying the coil glands. The capillaries were dilated, and the perivascular areas densely infiltrated with leucocytes, connective-tissue cells, and plasma cells. Libet described cysts of the coil gland ducts, not unlike those occurring in hydrocystoma. Aside from a slight parakeratosis in the vicinity of the sweat pores, the epidermis is affected but little. The sebaceous glands are not involved. In cases tested by Jadassohn there was no reaction to tuberculin.

Prognosis and Treatment.—The disorder is a chronic and persistent one, but tends to disappear spontaneously on the approach of puberty. Internally, vascular stimulants, and tonics, particularly cod-liver oil and the iron preparations, have been recommended. Locally, astringents, as tannoform and resorcin, may be tried. Multiple linear scarification has been suggested. The application of radium or the x-rays would probably prove curative in some instances. The condition of one patient under my care was greatly benefited by the use of the former agent.

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4. DISEASES OF THE NAILS.

ONYCHAUXIS.

Synonym.—Hypertrophy of the nail.

Definition.—Overgrowth of the nail plate, in any direction, and from any cause.

Symptoms.—Onychauxis may be congenital or acquired, idiopathic or symptomatic. One or several nails may be involved, the resultant changes varying greatly in character and in degree. Occasionally cases are encountered presenting hypertrophy of some of the nails and atrophy of others. Simple enlargement of the nails occurs in acromegaly, and as an accompanying manifestation of the "clubbed fingers" of chronic pulmonary tuberculosis and of certain valvular diseases of the heart. All of the nails on one or both hands may be involved. Paronychia is a not uncommon complication of ungual hypertrophy, and, in addition to the periungual inflammation, the nails may become friable and exhibit a tendency to split or crack on slight provocation, or even without apparent cause.

ONYCHOGRYPOSIS.

Onychogryposis is a term applied to extreme cases of hypertrophy in which the affected nails become greatly elongated, and curved or claw-like. As a rule only one nail, usually that of the great toe, is involved, but rarely several or more are affected.

Unna applies the designation of "scleronychia" to an extremely chronic disorder of the nails which is characterized by thickening and roughness, with a loss of elasticity and transparency of the affected structures. The lunulae are no longer marked, and longitudinal furrowing is not unusual. The anterior border is rough and irregular, and the nails have a yellowish-gray color. There is no diminution in consistence, however, and no tendency to exfoliation or to tears of the border, such as occurs in eczema of the nail plate. Onychauxis is a not infrequent complication of chronic, scaly, inflammatory diseases of the skin, as eczema and psoriasis, and often develops in the course of disorders due to infection with certain vegetable fungi (see onychomycosis).

ONYCHIA.

Onychia, or inflammation of the nail bed, usually occurs as a result of trauma or of pyogenic infection, and may be followed by shedding of the nail plate, or superficial or deep ulceration of the underlying ungual structures.

PARONYCHIA.

Paronychia, or *whitlow,* is characterized by acute or subacute inflammation of the periungual structures. As in onychia, one, two or more nails may be involved. The process may be quite superficial, with very little ensuing destruction of the affected tissues, but frequently the underlying border of the nail-fold is involved, and there is more or less pus formation, usually with subsequent casting off of the nail. The milder forms of paronychia are not uncommon sequelæ of dermatitis and eczema of the hands, and the graver types occasionally develop in the course of syphilis, but usually, as Morrow and Lee have shown, they result from infection with the common pyogenic cocci.

Etiology and Pathology.—In the majority of instances, onychauxis is due to, or associated with, various other cutaneous disorders, especially eczema, paronychia, psoriasis, occupation dermatitis, and syphilis (C. J. White). Trauma is apparently an important causative factor in some cases, and disorders of the nervous system, particularly leprosy and Morvan's disease, in others. Onychia may result from trauma, infection, or the presence of foreign bodies. Paronychia is sometimes syphilitic or tuberculous in origin, but in the majority of instances it is probably due to the white or yellow staphylococcus (Morrow and Lee). Infection not infrequently occurs through the medium of dirty manicuring instruments.

Treatment.—In onychauxis due to syphilis, resort should be had to antiluetic remedies. In the vast majority of instances, however, the constitutional treatment of ungual hypertrophy is entirely empirical, and of doubtful value. Arsenic may prove valuable in some instances. Of the various local measures, those calculated to remove or destroy the excess of nail substance are the most valuable. The horny masses underneath the nail-plates can be dissolved out by means of sodium hydrate solution, but a better and safer plan is to employ a milder keratolytic, as salicylic acid. This agent is best applied in the form of an ointment, in strengths of from 20 to 30 per cent. In cutting the nails, clippers are preferable to either curved or straight scissors. The treatment of both onychia and the more severe forms of paronychia is essentially surgical. In the milder cases, ammoniated mercury ointment, or long continued immersion in a hot solution of lysol (1 per cent) may prove serviceable. Morrow and Lee employed a saturated solution of chrysarobin in chloroform with success. The plica unguium was raised from the nail, and the affected area swab-

bed with the chrysarobin preparation once daily until there was no longer any pus formation. Should the chrysarobin tend to set up a dermatitis, the treatment is to be pursued with caution. In those instances characterized by extensive involvement and much suppuration, the quickest and most satisfactory method of securing relief is by avulsion of the nail, to be followed by the application of moist, antiseptic dressings.

Unguis Incarnatus, or ingrowing nail, is a disorder characterized by the lateral growth into the soft parts of the border of the nail. It is usually due to ungual pressure, and a result of ill-fitting foot wear. The treatment is surgical.

Pterygium.—This is a term employed to denote abnormal advance of the epidermal fold overlying the proximal border of the nail-plate. It may be congenital or acquired. Cases of the latter variety may develop as a result of neglect, or of long continued exposure to the x-rays (Ormsby).

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ATROPHIA UNGUIUM.

Synonyms.—Atrophy of the nails; Onychotropia.

Atrophy of the nails is characterized by changes which may affect the consistence, elasticity, shape, size or contour of the affected plates. As a rule they are opaque and lusterless, and longitudinal or transverse grooving is not uncommon. Occasionally, the surface may be marked by pits or depressions, which impart to the nail a rough, worm-eaten appearance. The condition may be congenital or acquired, but is seldom if ever idiopathic. In the congenital examples both atrophic and hypertrophic changes may be present, as in the hereditary cases reported by C. J. White and by Nicolle and Halipré. In rare instances there may be an entire absence of the nails, with or without associated cranial alopecia (Hutchinson).

In the acquired types, various terms are employed to designate the character of the changes that have occurred. Thus the designation of "koilonychia" has been suggested by Heller for the condition which Crocker describes as "spoon nails." The disorder usually affects the

fingers only, and may be hereditary or acquired. The nails are thinned, and concave from side to side with the edges everted. Crocker's case developed in the course of an attack of lichen planus, and other instances have been recorded in rheumatism, and acanthosis nigricans. There is frequently associated leuconychia.

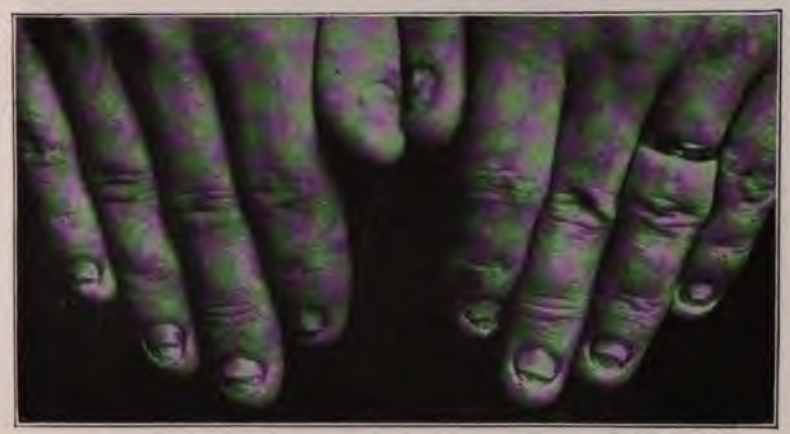

Fig. 783.—Symmetrical atrophy of nails. (Courtesy of Dr. J. C. E. King and Dr. H. G. Parker.)

Fig. 784.—Symmetrical atrophy of nails. (Courtesy of Dr. J. C. E. King and Dr. H. G. Parker.)

Onycholysis, or *anychoschizia,* is a term applied to loosening of the nail from its bed without actual shedding. The condition may be idiopathic, but is usually symptomatic, as in psoriasis, eczema and syphilis. Under the title of "Egg-Shell Nail," Hyde has described a peculiar disorder of the nails characterized by upturning of the free border, with increased translucence of the entire plate.

Fig. 785.—Spoon nails. Varney has found nails of this type quite common in syphilis, and considers the condition more or less pathognomonic. (Courtesy of Dr. H. C. Varney.)

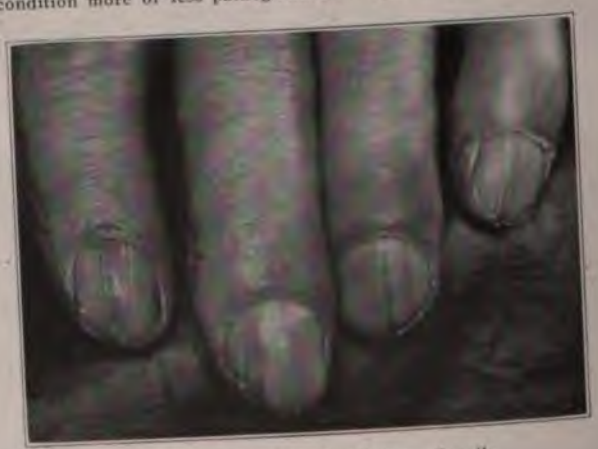

Fig. 786.—Longitudinal striation of nails.

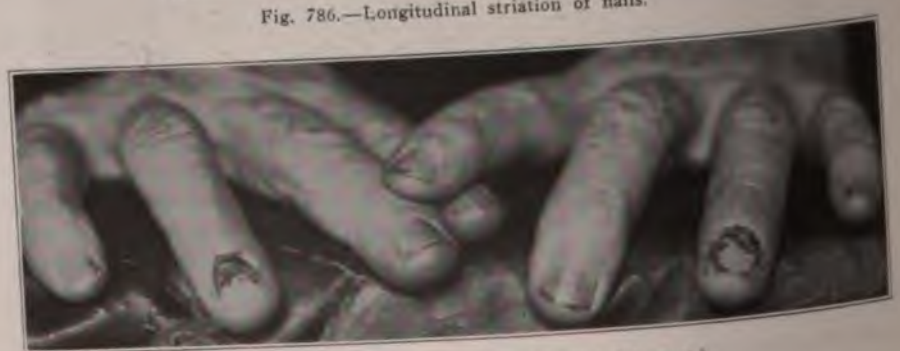

Fig. 787.—Shedding of nails. (Case cited in text.)

Leuconychia, or *leucopathia unguium*, may be partial or total, and the white spots, or "gift spots" may occur in the form of white spots of various sizes, streaks, or transverse bands. One or more nails may be affected. The lesions usually appear near the lunula, and progress toward the free border with the growth of the nail. Rarely,

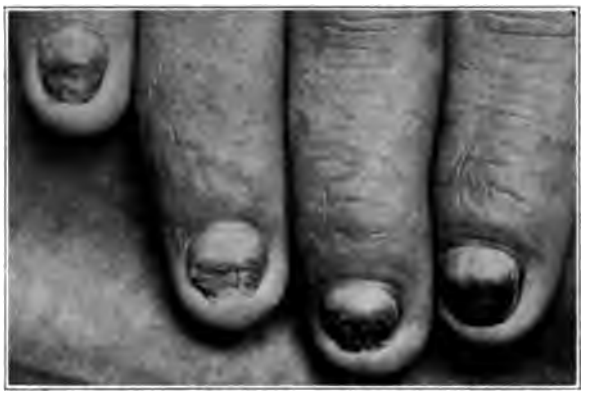

Fig. 788.—Atrophy of nails. (Courtesy of the U. S. Public Health Service, Immigrant Hospital, New York City.)

Fig. 789.—Transverse bands on nails in a case of pellagra. (Courtesy of Dr. W. C. Brownson.)

it may be hereditary, as in the case of a negro, observed by Howard Fox and Pisko.

Onychorrhexis, or *brittleness of the nails*, may be congenital or acquired. There may be coincident longitudinal furrowing, and usually more or less thinning of the nail plate.

Ridging and furrowing of the nails, either longitudinal or trans-

verse, sometimes occur, particularly in the course of severe constitutional disorders, or following disturbances of local nutrition (as in Zeisler's extremely interesting case).

Onychomadesis, or *onychoptosis,* is a somewhat rare disorder, characterized by periodical or intermittent shedding of one or more finger- or toe-nails. The affection frequently involves only certain fingers or toes, usually without apparent cause. D. W. Montgomery has described a case in which the tendency to nail loss appeared to be hereditary and more or less continuous. Shedding of the nails is a not infrequent sequel of scarlet fever, and may occur in the course of certain other systemic maladies, as syphilis, diabetes mellitus, and typhoid fever. Occasionally it is an accompaniment of grave disorders of the nervous system, and in rare instances it has been observed conjointly with alopecia universalis. Brown-Séquard has reported a case which developed following section of the sciatic nerve, and I have noted a somewhat similar instance of eleven years' standing which followed a crushing injury of the leg, and involved only the nail of the left great toe. The nail plate was thrown off regularly at intervals of about eight months. Falcone observed recurrent shedding of the nails, preceded by tingling and suppuration of the matrix, in a hysteric. Recently I had an opportunity to examine a somewhat similar case, occurring in the practice of my friend, Dr. Park McDonald. The patient was a highly neurotic German housewife, aged 56, and the disorder had been present for eight years. Both the fingers and toes were affected. (See Fig. 599.) Usually, but not invariably, the involvement was symmetric. At intervals of from one to three months the tips of certain toes or fingers would commence to tingle and burn, giving rise to so much pain and distress as to cause loss of sleep. In the course of four or five days the nail plate of the affected phalanges would drop off, exposing a tender, but apparently clean surface. Syphilis and diabetes could be excluded, and a thorough examination by a skilled neurologist failed to disclose the presence of any organic nervous disorder.

Etiology and Pathology.—Aside from the symptomatic types, the etiology of atrophic disorders of the nails is not well understood. Disease or injury of the so-called trophic nerves probably plays an important part in the causation of many cases. Le Dantec has reported some interesting examples following war wounds. Heredity accounts for a few instances.

The white spots in leuconychia are probably due to the presence of

air in the interstitial corneal spaces, and local traumatism is the most important factor in their production, as Heidingsfeld has shown.

Treatment.—Of the various empirical remedies that have been sug-

Fig. 790.—Epidermidolysis bullosa, showing atrophy of nails.

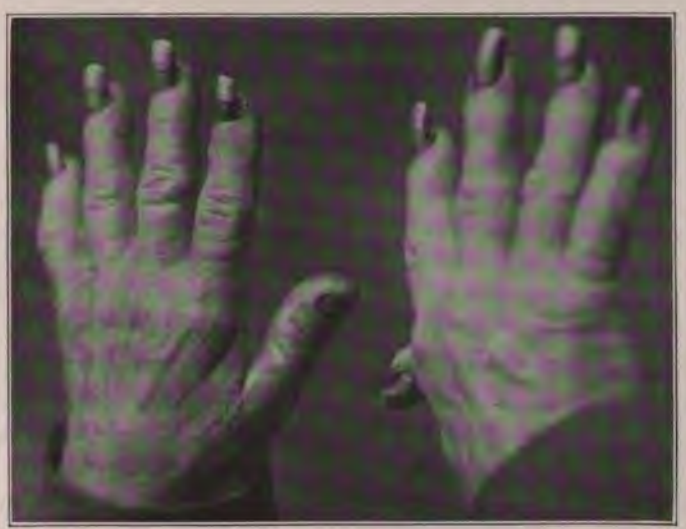

Fig. 791.—Onychogryphosis due to syphilis. (Courtesy of Dr. Irwin C. Sutton.)

gested for the constitutional treatment of atrophia unguium, arsenic holds first place. As a rule the agent must be employed over long periods of time, however, if the full benefit is to be derived, and care

must be exercised to guard against any untoward effect on the healthy skin.

Locally, protection from trauma, and from contact with strong soap and similar alkalies, is essential. For masking the whiteness of "gift spots," Stelwagon recommends the occasional application of a 5 to 10 per cent resorcin lotion.

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ONYCHOMYCOSIS.

Definition.—A disorder of the nail due to the invasion of vegetable fungi.

The vegetable parasites attacking the nail are the trichophyton endothrix and ectothrix (ringworm), and the achorion schönleinii (favus). The nails may be involved primarily or secondarily.

Symptoms.—In both ringworm and favus of the nails the process of invasion is gradual, and the free extremity of the nail, particularly the lateral folds, first exhibits evidence of the disease. One or more nails may be involved. The affected portion becomes rough, opaque and crumbly, and is separated from the underlying bed by a thick layer of epithelial débris which commonly contains many fungi. The nail-plate loses its transparency, and becomes spongy, irregular, and at times honeycombed. Ridges and furrows are not uncommon, and as a result of surface irregularities there is usually more or less subsequent deformity of the nail plate.

Etiology and Pathology.—The causative organisms are distributed through the affected subungual structures, and as a rule can readily be detected in scrapings which have been subjected to the action of liquor potassæ.

Prognosis and Treatment.—The disorder is an extremely persistent one, and exhibits no tendency to spontaneous cure. The nails may be filed or pared down in order to facilitate the action of an antiseptic on the diseased bed, but the removal of the overlying corneous material can be best accomplished by means of the cautious application of liquor potassae. Following this procedure, strong parasiticides are

to be employed. Those containing iodine or fresh sulphurous acid are probably the most efficient. Crocker and Norman Walker both recommend Harrison's method, which consists of the application of a 6 per cent solution of potassium iodide in equal parts of liquor potassæ and spirits of wine for several minutes, to be followed by immersion in a strong solution (1 per cent) of bichloride in equal parts of water and spirits of wine.

Dubreuilh speaks highly of a mixture of equal parts of pyrogallol and olive oil, and Stelwagon has found bathing of the parts in a strong aqueous solution of bichloride (.2 to 1 per cent), followed by ammoniated mercurial ointment, an excellent plan. Occasionally a saturated aqueous solution of sodium hyposulphite proves helpful. In some instances it is necessary to resort to avulsion (Foster).

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CLASS X.—PARASITIC AFFECTIONS.

1. DISEASES DUE TO ANIMAL PARASITES.

PEDICULOSIS.

Synonyms.—Lousiness; Phthiriasis; Morbus pedicularis.

Pediculosis is the term applied to the cutaneous symptoms arising as a result of the presence of pediculi, or lice, on the skin. Pediculi belong to the class Insecta, order Pyncheta, subdivision Parasitae, and the family Pediculidae. The three varieties which habitually attack human beings are known as the pediculus capitis, or head louse; the pediculus corporis, or body louse; and the pediculus pubis, or pubic louse. The first named makes its home on the scalp, and is grayish in color, or reddish when filled with blood, and oval in shape, with a short thorax, and a broad abdomen, marked laterally by well-defined, deep notches. The parasite measures from 1.0 to 3.0 mm. in length, and is about half as broad as it is long. The legs, six in number, are attached to the thoracic portion, and each terminates in a sharp, hook-like claw. The head is shaped somewhat like the blade of an assagai, and is furnished with a pair of short antennae. The eyes are placed just back of the antennae, and are black and prominent. The females are larger and more numerous than the males, and the anal pore lies in the last abdominal segment. The vaginal canal opens on the ventral surface, and connects directly with the oviducts. In the males the genito-anal pore, and the large, wedge-shaped penis are located on the dorsal surface of the abdomen, and each insect possesses two pairs of testicles.

The body louse is considerably larger than the one just described, but otherwise resembles it in many respects. The parasites average from 2.0 to 4.0 mm. in length, the female being the larger. They are yellowish-gray in color, and more or less translucent.

The pubic or crab-louse (phthirius inguinalis) is the smallest of the three varieties. In length it varies from 1.0 to 2.0 mm. and is almost as broad as it is long. The head is triangular in shape, and the neck extremely short. The thorax and abdomen are merged into one, and the anterior portion of the trunk is provided with six short,

hairy legs, the tarsal extremities of which are provided with large and relatively powerful, crab-like hooks. Eight stubby, prehensile legs likewise project from the margin of the abdomen which is indented laterally, and which, in the female, terminates posteriorly in a V-shaped notch. In this species also the female is the larger. The crab-louse usually inhabits the pubic regions, but it may live in any

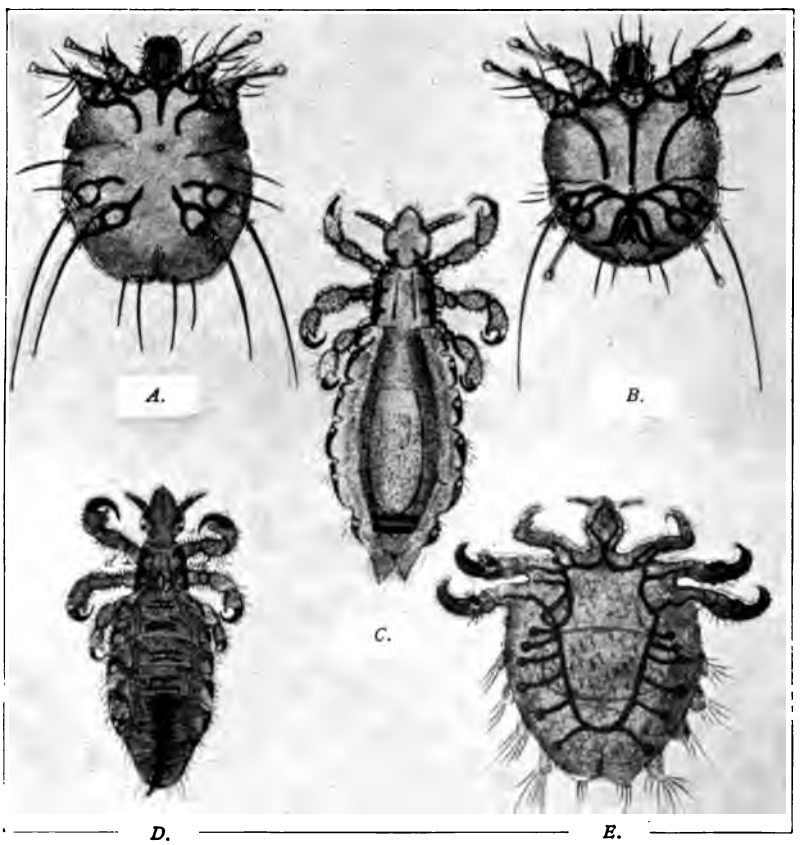

Fig. 792.—Animal parasites. *A*, acarus scabiei, female (ventral surface); *B*, acarus scabiei, male (ventral surface); *C*, pediculus corporis; *D*, pediculus capitis; *E*, pediculus pubis.

locality which is provided with stiff hair, hence its occasional occurrence on the abdomen, breast, beard, moustache, eyebrows, lashes, and in the axillae.

As a rule, the three varieties of pediculi seldom invade each other's territory, although instances of such migration have been noted by Grindon and others. The ova or eggs (nits) are small, whitish or

grayish to dark brown, pear-shaped bodies, which are glued to the shaft of the hairs in the head and pubic varieties, and deposited in the folds of the clothing and on the lanugo hairs in pediculosis corporis. The eggs are deposited on the shafts near the base, consequently the more mature ova lie nearest the distal extremity. The gluey, chitinous substance with which the ova are attached is insoluble in water, and in most of our ordinary media. The eggs hatch in from four to seven days, and the young lice become capable of reproduction in less than a month. Certain individuals appear to be more susceptible than others to infection with pediculi. It is difficult to ascribe a reason for this, but that such a predilection does sometimes exist has been repeatedly proved.

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PEDICULOSIS CAPITIS.

Synonyms.—Pediculosis capillitii; Phthiriasis capitis; Head-lice.

Symptoms.—Children are more susceptible than adults, and females are attacked more frequently than males. Itching is usually the predominant symptom, and the one from which relief is sought. Aside from this, and the presence of a few parasites and their ova, to be discovered often only on close examination, very little evidence of disease may be present. Usually, however, and particularly in longstanding cases of the disease, one finds a dermatitis of variable degree, characterized by exudation, and crusting, with more or less matting of the hair, especially in the occipital region. In the more severe and long neglected cases, the shafts in this locality may be matted and glued together into a solid, felted mass consisting of hair, dried serum and pus, nits, dirt and other extraneous matter, the whole fairly swarming with pediculi (plica polonica), and having a most disgusting odor. Next to the occiput, the post-auricular regions are the sites of predilection. As a result of excoriation from scratching, and subsequent infection with pyogenic organisms, a coincident impetigo is not uncommon, and eczema or infectious eczematoid dermatitis occasionally develops. The post-cervical lymphnodes frequently become enlarged and tender, and may suppurate. Pediculi and ova can always be discovered if a thorough and exhaustive search is made. In suspicious cases, care should be exercised to secure positive evidence of the presence of the parasites or their eggs before the patient is informed of the

nature of the disorder, and it is extremely important that epidermal scales encircling hair shafts, or trichorrhexis nodes are not mistaken for nits.

Etiology.—Infection usually occurs only following intimate contact. The common use of combs and brushes, and the interchanging of head gear are probably the most frequent sources of infection.

Diagnosis.—The affection is to be differentiated from pustular eczema of the scalp. The usual location of the lesions is suggestive,

Fig. 793.—Pediculosis capitis, showing ova on hairs. (Courtesy of Dr. J. E. Lane.)

and the presence of the pediculi and their ova is confirmatory. Nits must not be confused with loose epidermal scales perforated by hair shafts. These dry masses of epithelium are loose, irregular, laminated, and non-adherent.

Treatment.—In long-haired individuals clipping seldom is necessary, although the procedure will facilitate treatment. One of the simplest and best methods of eradicating the disease is by means of the "petroleum cap." This consists in thoroughly soaking the scalp with crude petroleum, and applying a loose head bandage which is allowed

to remain in place from twelve to twenty-four hours. Care must be exercised to guard against exposure to an open flame. This danger may be lessened by diluting the liquid one-half with olive oil before applying it to the scalp. At the end of twelve or twenty-four hours the petroleum dressing may be removed, and the head thoroughly scrubbed with soapy water. Later, if necessary, the remedy can be applied a second time. Xylol also is an excellent parasiticide in these cases. Aqueous solutions of tincture of cocculus indicus (33 per cent), or bichloride of mercury (.2 per cent), may be employed if the scalp is not too much inflamed. These remedies should be applied freely two or three times daily for several days, and their use should be supplemented by frequent shampoos. They are more elegant, but less efficient than petroleum. If the scalp is greatly inflamed, emollient ointments are often preferable to lotions, and recourse may be had to mild preparations of white precipitate or the yellow oxide of mercury. Should the nits persist, their removal may be hastened by the use of alkaline (borax) or acidulated (acetic acid) lotions, supplemented, if necessary, by the employment of a fine-toothed comb.

PEDICULOSIS CORPORIS.

Synonyms.—Phthiriasis corporis; Pediculosis vestimenti seu vestimentorum.

Symptoms.—As a rule the pediculus corporis lives and lays its eggs in the clothing, especially about the seams in the interscapular, shoulder and waist regions, and comes out on the surface of the body only to feed. The character of the cutaneous manifestations varies with the duration of the affection, and also with the sensitiveness of the patient's skin. The individual lesions are minute, red, non-inflammatory points, elevated but little, if at all, above the general surface. Because of the urticarial tendency which usually is present, however, the lesions quickly become papular or wheal-like, and as a result of scratching, appear as minute inflamed elevations, with scratched, blood-crusted apices. Adults are attacked more frequently than children. Itching is a prominent and constant symptom. Owing to the continued irritation, and the subsequent trauma from scratching, secondary eczematous manifestations frequently develop, and in long-standing cases there may be more or less brownish pigmentation of the skin. In rare instances the discoloration may involve the buccal mucosa and the glans penis as well as the areas attacked by the para-

sites, a fact which Thibierge and others believe to be due to either the transference of pigment from the inflamed lesions, through the blood, or to the presence of a toxin injected by the pediculi. Constitutional symptoms usually are wanting, although Jamieson and Payne have reported cases in children presenting evidence of a slight pyrexia, which they ascribed to reflex causes or to the action of "some poison inserted by the insect analogous to that of the mosquito."

Diagnosis.—Pediculosis corporis is to be differentiated from pruritus, urticaria, and scabies. The presence of the characteristic hemorrhagic puncta, and scratch marks, occasionally accompanied by pig-

Fig. 794.—Scratch marks on back in a case of pediculosis corporis.

mentation, over the shoulders and in the region of the nucha is suggestive, and should always lead to a careful search for pediculi and ova in the seams of clothing. Not infrequently patients change their underwear immediately prior to consulting a physician, a fact which should not be overlooked in suspicious cases which present vermin-free clothing. The presence of the characteristic parallel 2-3-4 linear excoriations in the interscapular region is almost pathognomonic.

Treatment.—The pediculi infest only the clothing, and are readily destroyed by heat. The underwear may be boiled in a weak solution of borax, and the outer clothing exposed to the action of dry heat by prolonged baking in an oven. To guard against reinfection from ova which may be attached to lanugo hairs on the body, the patient should

receive a thorough scrubbing with soap and water, to be followed, if thought advisable, by a weak bichloride (1 to 5,000) bath. Dampening the clothing and then pressing the seams with a hot iron constitutes an effective method of killing the ova. In addition to these measures it may be necessary to resort to the use of powdered sulphur in the clothing, or an occasional application of a mild sulphur ointment. The question of getting rid of pediculi in a body of infected troops is often a serious matter. Creel recommends the exposure of infected clothing to the action of cyanide gas. Foster found heat and hydrocyanic acid the best agents where the work was to be done on an extensive scale. For small operations, carbon tetrachloride vapor is probably the best and most economical agent. About two hours' exposure is required; and the cost is from 2 to 5 cents for the treatment of the clothing of one soldier. Muto has found vapor from a 10 per cent solution of creolin effective. Kinloch speaks highly of immersion in gasoline or benzine, or, if the clothing will not be injured by water, immersion in a 2 per cent soapy solution of trichlorethylen or 10 per cent tetrachlorethan. Peacock, who has had wide experience in combating the disorder, recommends disinfection of the clothing by horse drawn "Thresh" methods (steam at 215 degrees F., for three-quarters of an hour). Exposure to boiling water for one and one-half minutes is sufficient to kill ova. For use on the body, Peacock has found a crude oil ointment composed of 2 pounds of soft paraffin and 4 ounces of crude tar oil the best application. He also speaks highly of N. C. I. powder (naphthalene, 96 per cent; creosote, 2 per cent; iodoform, 2 per cent).

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PEDICULOSIS PUBIS.

Synonyms.—Crabs; Phthiriasis pubis; Phthiriasis seu pediculosis palpebrarum (when involving the lashes).

Ordinarily the crab louse confines its activities to the genital, abdominal, and presternal regions, but it may involve the axillae, eyebrows, lashes, or even the border of the scalp (Grindon). Owing to the translucent character of the parasite, and its usual position near the base of the hair filament, detection is often difficult, and frequently the recognition of the true nature of the disorder is dependent upon the discovery of several or more of the ova attached to a shaft, or

the presence of the minute, brownish or blackish, iron-rust-like spots of excrement on the affected skin. With the exception of the difference in location of the involved areas, the cutaneous lesions and the subjective symptoms differ but little from those occurring in pediculosis corporis.

Maculæ Cœrulæ are rounded or oval, pea- to finger-nail-sized, grayish pigmented spots which occasionally develop on the abdomen, thorax, and inner surfaces of the thighs as a result of coloring matter introduced into the skin by the crab-louse while feeding (Duguet). Individuals possessing clear, white, transparent skins are apparently more susceptible than others to the condition. The lesions are transitory and give rise to no subjective symptoms.

Diagnosis.—Persistent itching in the genital region should always arouse suspicion of pediculosis pubis. The disorder is not necessarily a venereal one by any means, and infection can readily occur through contact with infected bedding and clothing as well as by intimate contact. The diagnosis is to be confirmed by the detection of the parasites or their ova. In conducting the search it usually is advisable to resort to the use of a hand glass.

Treatment.—The parts should first be thoroughly cleansed by means of soap and water. Afterward a solution of bichloride of mercury (1 to 1,000) in equal parts of alcohol and water, or in water to which a small amount of vinegar or acetic acid has been added, may be employed; or tincture of cocculus indicus, diluted with three parts of alcohol or water, may be applied several times daily. Mercurial ointment, and the official yellow oxide or ammoniated mercurial preparation also are efficient, but are nasty and disagreeable to use, and frequently leads to dermatitis venanata. If eczematous manifestations are present, the irritation should be subdued by means of calamine lotion, zinc oil, and similar soothing remedies. In pediculosis of the eyelashes the parasites and ova may be picked off with small forceps, and weak yellow oxide of mercury or citrine ointment applied to the surface and margins of the lids.

CIMEX LECTULARIUS.

Synonyms.—Bed bug; Acanthia lectularia.

The cimex lectularius makes its home in the crevices of furniture, and comes forth to seek the human body only for the purpose of obtaining nourishment. In addition to the cutaneous punctures made by the insect in its efforts to reach the superficial capillaries, it is

probable that an irritating fluid is injected into the skin in order to increase the flow of blood to the part attacked. As a result of the ensuing reaction, a transitory wheal develops, and this may be succeeded by a circumscribed purpuric lesion which persists for several days or longer. The lesions are usually multiple, and commonly give rise to more or less itching and burning. The ankles and buttocks are the sites of predilection, although the abdomen, and various other parts of the body also may be attacked.

Diagnosis.—The condition is to be differentiated from urticaria ab ingestis. In the latter disorder the eruption is generalized, and more or less symmetric, and the lesions do not present a central puncture or exhibit a purpuric tendency.

Treatment.—The itching and burning can be promptly relieved by the use of carbolized calamine lotion or zinc oil.

PEDICULOIDES VENTRICOSUS.

This insect, which gives rise to the disorder variously known as grain itch, straw itch, barley itch, mattress itch, acro-dermatitis urticarioides (Schamberg), dermatitis urticarioides parasitica, and dermatitis, belongs to the class Arachnida, order Acarina, family Tarsonemidae, genus Pediculoides, and is parasitic upon the larvae of certain soft-bodied insects (as the wheat-straw worm and the joint worm) which in America are commonly found in wheat fields.

Symptoms.—The eruption is of more or less generalized distribution. It develops rapidly, and may assume any one of three fairly distinct clinical types (Schamberg). In the first and most frequent of these, the lesions are urticaria-vesiculo-pustular in character, in the second they consist of large, central vesicles or pustules ("varicelloid"), and in the third they assume an erythema multiforme aspect. All are accompanied by intolerable itching, which is worse at night. Ultimately, as a result of trauma from scratching, a pyogenic element frequently is introduced, and an impetigo, or an infectious eczematoid dermatitis may develop. Systemic symptoms, consisting of rigors, followed by mild pyrexia and acceleration of the pulse rate and often accompanied by anorexia and malaise, are not unusual at the beginning of the attack. Moderate enlargement of the lymphnodes also is occasionally noted. The cutaneous lesions probably develop as a result of the introduction into the skin of an irritating substance which is injected by the pediculoides during the

process of feeding. Laboulbene and Meguin believe that nature provides the parasite with this "venomous saliva" in order that it may kill the larvae and nymph insects upon which it lives and multiplies. Histologically, in a vesicopustule on an urticarial base, Schamberg found the changes present essentially those of an urticarial lesion.

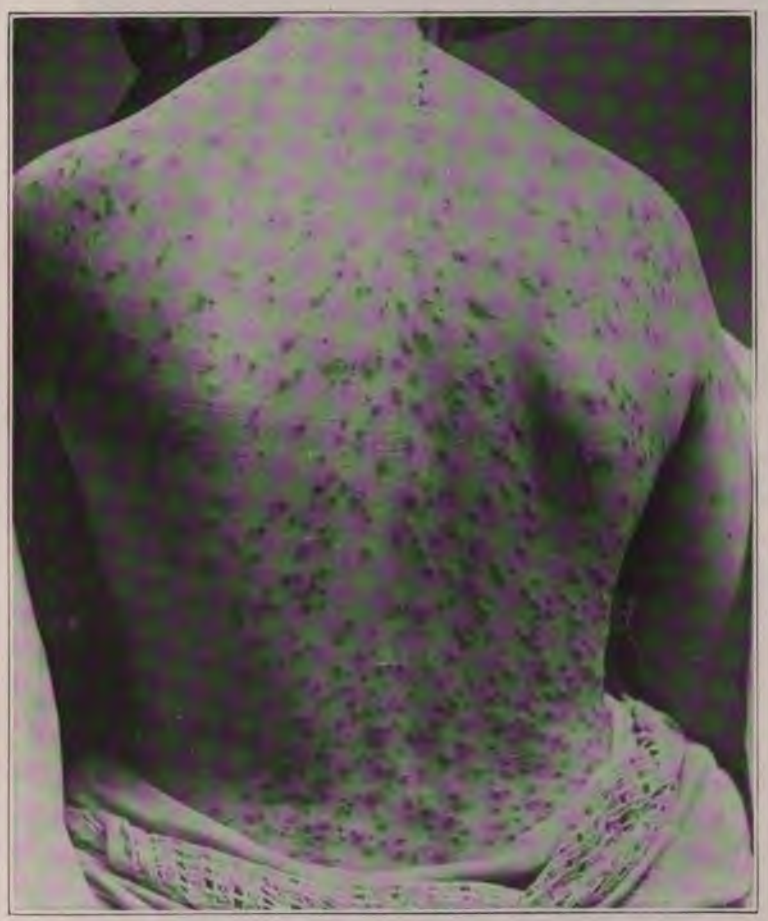

Fig. 795.—Grain itch. (Courtesy of Dr. J. F. Schamberg.)

There was circumscribed elevation of the epidermis, with thinning of the horny layers, and an entire absence of the granular stratum. No trace of a puncture, or of any parasitic appendage could be discerned. The rete cells were altered, and their tinctorial reactions changed, and the subjacent blood vessels and lymph spaces were

Fig. 796.—Grain itch. (Courtesy of Dr. J. F. Schamberg.)

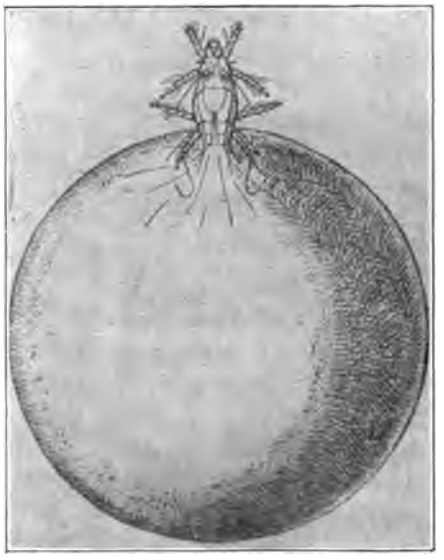

Fig. 797.—Grain itch. Pediculoides ventricosus, gravid female. (Courtesy of Dr. Webster.)

greatly dilated. The entire papillary layer was densely infiltrated with round cells, mast cells, and polynuclear leucocytes.

Diagnosis.—The affection is to be differentiated from urticaria,

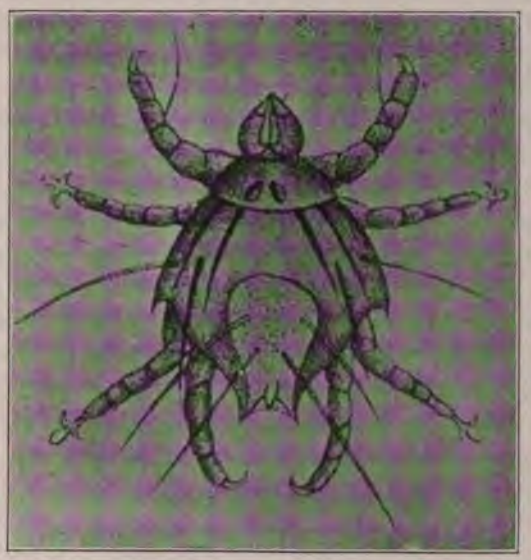

Fig. 798.—Pediculoides ventricosus, male. (After Braun.)

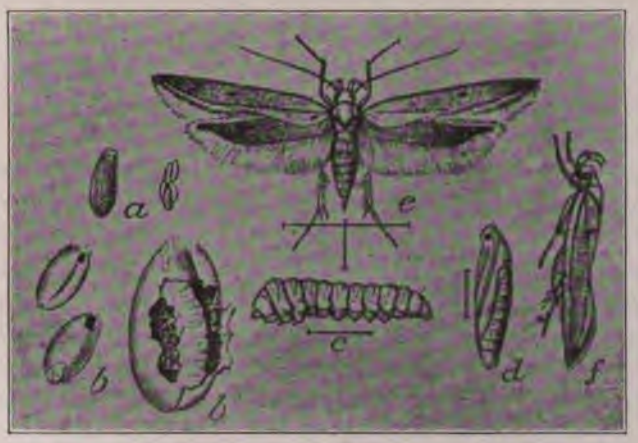

Fig. 799.—Pediculoides ventricosus, showing moth. (Webster.)

varicella, and scabies. In urticaria, central vesiculation rarely if ever occurs. The lesions usually are of brief duration, and groups of persons are seldom attacked. Varicella is to be distinguished by the

distribution of the vesicles, the rapid course of the eruption, and the absence of itching.

In scabies the sites of predilection are the dorsal surfaces of the interdigital webs, and the anterior axillary folds. The eruption develops slowly, and differs in character from that of acaro-dermatitis pediculoides.

Treatment.—The patient's clothing must be sterilized by steam, sulphur fumes or formaldehyde fumigation, and care exercised to guard against reinfection. The disease may be acquired from contact with straw that is used for any purposes, although it is probable that bed ticks filled with the material are the most common source of infection. In addition to disinfection of the clothing, and bedding, it is sometimes necessary to resort to the local use of a parasiticide. Schamberg has found an ointment consisting of betanaphthol (5 per cent), and precipitated sulphur (8 per cent), in benzoinated lard especially efficacious.

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COPRA ITCH.

Castellani, of Ceylon, has described a peculiar form of dermatitis which in some respects simulates scabies, and is induced by a minute, acarus-like parasite, the Tyroglyphus longior Gerv., variety castellani Hirst.

The insect apparently attacks the skin in a manner very similar to that of the pediculoides ventricosus, and never burrows beneath the surface. The hands, arms, legs, and sometimes the trunk may be involved. The face is seldom, if ever, affected. The lesions are pruriginous papules, which subsequently become papulopustules and pustules. The eruption seldom disappears spontaneously, at least while the patient continues handling infected copra. MacLeod has recently reported a case which was contracted while the patient was unloading a shipload of cocoanut or copra, a good part of which was decayed. Castellani found betanaphthol ointment (5 to 10 per cent) a useful remedy.

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COPRA ITCH.—*Castellani*, Brit. Jour. Dermat., 1913, p. 19. — *MacLeod*, Brit. Jour. Dermat., 1915, p. 118.

PULEX IRRITANS.

Synonym.—Flea.

The common flea is of practically universal distribution. Some individuals are apparently more susceptible than others to its attacks, and the amount of ensuing irritation likewise is variable. Ordinarily the cutaneous lesions are pale or erythematous, evanescent, itchy wheals, with a minute, reddish, hemorrhagic point at the site of puncture. Occasionally the manifestations may simulate those of purpura simplex. The lesions are often grouped, or they may be arranged lineally. The symptoms may resemble those of urticaria, as in the cases described by Chipman. Camphor and the essential oils, as pennyroyal and eucalyptus, generally exert a prophylactic effect by keeping the body free from the pests. For the relief of the itching, which in some instances is intense, resort may be had to carbolized calamine lotion, or to ointments containing phenol, menthol, thymol, and similar antipruritics.

IXODES.

Synonym.—Wood-tick.

The wood-tick is commonly found on trees and underbrush. It sometimes attacks human skin, however, for the purpose of withdrawing blood from the superficial capillaries. The female is generally, if not invariably, the offender. The beak is guarded laterally by maxillo-labial projections which are armed with recurved hooklets, and is thrust deeply into the skin. As a rule the parasite's head cannot be withdrawn until the insect has finished feeding. If forcible extraction is attempted, the proboscis is liable to be broken off and left in the wound, where later it may give rise to considerable pain and inflammation. The better plan is to allow the parasite to imbibe its fill of blood, when it may be readily and painlessly removed; or temporarily to paralyze it by the application of a few drops of tobacco juice, benzine or one of the essential oils. The cutaneous lesions are usually urticarial in character, and are accompanied by more or less itching. Carbolized ointments or lotions may be employed for the relief of the subjective symptoms.

BROWN-TAIL MOTH.

J. C. White, Towle, Tyzzer, and others have described a peculiar form of dermatitis occurring in Massachusetts and other parts of New

England which results from the irritant action of the "nettling hairs" of the caterpillar of the brown-tail moth (Porthesia crysorrhœa), on the human skin.

Symptoms.—The earlier manifestations are pruritic in character, and develop in from twenty to thirty minutes following contact with the offending material. Shortly afterward, erythematous maculæ appear, usually to be followed by urticarial wheals. Occasionally the inflammatory process is more pronounced, and a dermatitis or an eczema develops. The cutaneous lesions are limited to the area of inoculation. The sites of predilection are the face, neck, and arms. Should the hairs become lodged in the clothing, the eruption may be generalized, and the patient will be exposed to an attack every time the garments are worn. The eruption may persist for several days

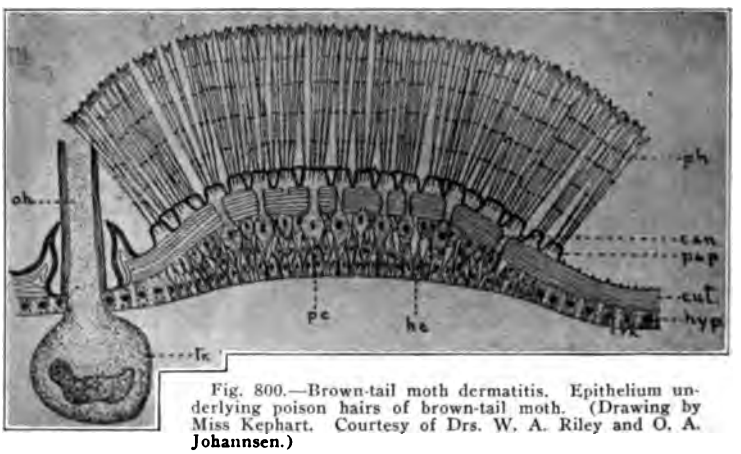

Fig. 800.—Brown-tail moth dermatitis. Epithelium underlying poison hairs of brown-tail moth. (Drawing by Miss Kephart. Courtesy of Drs. W. A. Riley and O. A. Johannsen.)

or weeks. Itching is a constant and troublesome feature. The disorder usually develops during the months of May and June, at a time when the caterpillars are maturing.

Etiology and Pathology.—The malady is due to an irritant carried on the surface or in the substance of the "nettling hairs" which occur on the cocoon and ovum, as well as on the caterpillar. The hairs are minute, pointed, one-barbed shafts, averaging about 0.1 mm. in length, which sometimes penetrate the deeper layers of the corium. As Tyzzer has demonstrated, however, the irritation is not purely mechanical, but is largely due to the presence of a chemical of unknown nature on or in the offending shafts. This substance is capable of exciting reactionary changes in the red-blood corpuscles, and of caus-

ing a necrosis of some of the epidermal cells with which it comes in contact.

Treatment.—As a prophylactic measure, contaminated clothing should be destroyed. The hairs are generally imbedded so deeply in the skin that a considerable period of time must necessarily elapse before nature can get rid of the irritant. Holland found the application of mercuric chloride lotion (1 to 2,000), followed by the painting of each spot with flexible collodion a useful measure. Carbolized lotions, and ointments containing phenol, menthol, and similar antipruritics, may be tried.

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SCABIES.

Synonym.—The itch.

Definition.—An infectious disease due to an animal parasite, the acarus scabiei, characterized by the presence of burrows or cuniculi (made by the female parasite, for the purpose of depositing her ova), by intense itching, and by multiform lesions which develop as a result of scratching.

Symptoms.—The earliest noticeable manifestation of the disease is itching of variable degree, which is always worse at night. The pruritus is usually localized at first, and is fairly well confined to certain areas of predilection—the dorsal surface of the interdigital webs, the flexures of the wrists, the anterior axillary folds, the lower abdomen, and the genitalia. In very young children, the palms and soles frequently are involved. Other parts of the body also are occasionally attacked. The face and scalp generally escape. On close examination a few minute lesions, consisting mainly of papules and vesicles, may be discovered, and by the aid of a hand glass the tiny cuniculi or burrows can usually be found. These appear as darkish or whitish, tortuous or zig-zag, superficial, thread-like channels. The open end is marked by a slight elevation, and the closed end by a tiny grayish speck which marks the resting place of the female parasite. The burrows vary from .5 to 10. cm. in length, and are most numerous on the interdigital webs, the mammary region in women, and the shaft of the penis in men. The ova are deposited within the burrow, and the larvae develop in the course of a week to ten days. As a rule, the

Fig. 801.—Scabies, showing lesions on webs of fingers.

Fig. 802.—Scabies, in an infant.

Fig. 803.—Scabies, showing typical involvement of anterior axillary fold.

disease is slowly, but steadily progressive, and if neglected the involvement soon becomes more or less general. While the eruption may involve practically the entire body, the inflammation is usually more pronounced in those locations where the skin is thin and moist.

Fig. 804.—Scabies. (Courtesy of Dr. George M. MacKee.)

In cleanly individuals the eruption usually is scanty, although in persons whose skins are extremely sensitive and irritable, or in those whose natural resistance to staphylococci has been lowered from any cause, the eczematous or impetiginous manifestations may completely

overshadow those of the original infection. In neglected cases of long duration, the number of acari may become very great, owing to the favorable conditions for multiplication supplied by the extensive crusting, and the disease may involve not only the trunk, limbs,

Fig. 805.—Scabies. (Courtesy of Dr. George M. MacKee.)

palms, and soles, but also the face and scalp (Norwegian scabies). This type is not uncommon in leper colonies, and may develop in individuals who are not particularly cleanly. Constitutional symptoms, aside from a slight eosinophilia, generally are absent, although

albuminuria has been noted in a few instances. Nephritis may occur as a result of medication with balsam of Peru. It should not be confused with albuminuria due to the disease itself, a not uncommon complication, as Ubersfeld has shown.

Etiology and Pathology.—The malady is produced by an animal parasite, the acarus scabiei (class Arachnidae, order Acarinae, family Sarcoptidae), and the disease is always a result of the deposition of an impregnated female on the skin. Intimate contact with infected

Fig. 806.—Norwegian scabies. (Courtesy of Dr. Wallace Beatty. Photo by Dr. Jocelyn Smyly.)

individuals or infested articles usually is essential. Knowles found the disorder a common one in soldiers, 1,500 of 2,000 dermatologic cases seen being either frank scabies or secondary to scabies. Among the better classes, in civil life the Pullman berth is a frequent medium of transmission. Both sexes are attacked impartially, and no age or class is exempt. The disease is less common in America than in Europe, although recent reports would indicate that the affection is on the increase in this country (Stelwagon). The disorder is encountered with far greater frequency in dispensary work than in private practice. The

multiform lesions are a result of trauma from scratching, and the pustular element so frequently present is due to secondary infection with the ordinary pyogenic cocci. Both the male and the female acarus infest the skin, but the malady is almost entirely due to the latter, and is a result of her efforts to secure a suitable repository, beneath the outer layers of the epidermis, for her ova. The parasite is an oval, crab-shaped animal, which averages from 0.2 to 0.45 mm.

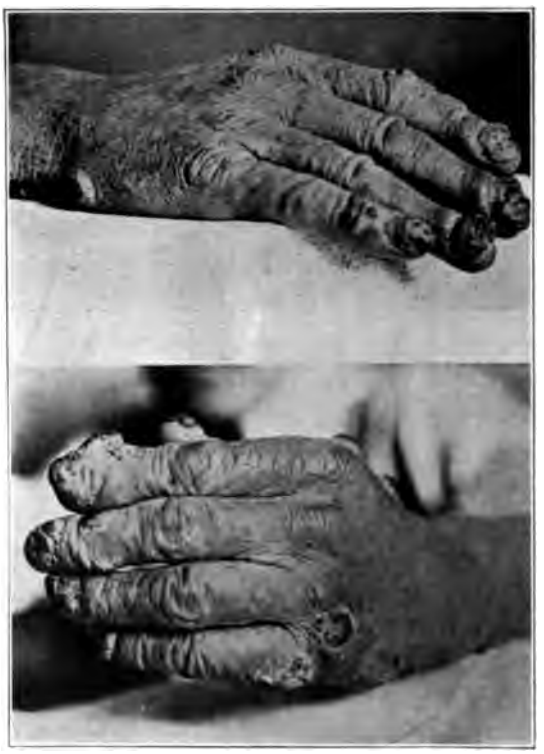

Fig. 807.—Norwegian scabies. (Courtesy of Dr. Wallace Beatty. Photos by Dr. Jocelyn Smyly.)

in length, and from 0.15 to 0.3 in breadth. (See Fig. 792.) The females are considerably larger, and far more numerous than the males. The female is provided with eight conical, stumpy legs. Each of the four anterior limbs is armed with a sucker, and each of the posterior with long bristles. The male also possesses eight legs, but the inner pair of his posterior extremities are equipped with suckers, and between these members is a horse-shoe-shaped, chitinous framework, which supports the penis. The burrows extend downward only to the

middle horny layer, and contain, in addition to the female parasite, the ova and fecal matter. Occasionally, cases of equine sarcoptic scabies occur in man. Parker has reported three instances, and I have recently met with two cases in little girls, contracted while playing with a Shetland pony.

Diagnosis.—The peculiar distribution of the lesions is suggestive. In persons of extremely cleanly habits, the hands frequently escape, but the anterior axillary folds in both sexes, the nipple region in the female, and the shaft of the penis in the male should always be carefully scrutinized. In babies and young children the soles, palms, and flexures of the wrists usually are involved. The malady is to be chiefly differentiated from pediculosis corporis and eczema. In pediculosis corporis the parasite or its ova can usually be found in the seams of the underclothing, the hands and feet are unaffected, and the interscapular area is usually the site of numerous long scratch marks. Eczema frequently involves the palms and soles, and the face. There is no history of contagion, and cuniculi are absent. The distribution of the eruption seldom simulates that of scabies, and nocturnal aggravagation of the itching is absent.

Prognosis.—The disease does not tend to spontaneous disappearance, but as a rule it yields very readily to appropriate treatment.

Treatment.—The eradication of the malady is entirely dependent upon the external use of parasiticides, to be followed, if necessary, by soothing applications for the relief of the associated dermatitis. Of the various remedies that have been suggested, sulphur is the most reliable, although betanaphthol, balsam of Peru, tar, styrax, and several of the essential oils sometimes prove curative. Previous to applying the remedy it is necessary that the surface be freed of dirt and other extraneous matter. This is best accomplished with the aid of soap and warm water, and a stiff brush (provided the skin is not too greatly inflamed). Afterward, the parasiticide may be freely and thoroughly applied and allowed to remain on the skin. A good plan is to apply the antiseptic morning and evening for a period of from three days to a week. The patient may then take a second warm, soapy bath, and change his underwear. The old clothing and the bed linen should be sterilized or destroyed. Ointments are generally preferable to liquids or powders, and a combination of remedies is usually more effective than any single one. As a rule the addition to the mixture of a mechanical keratolytic, as prepared chalk, will expedite matters. Betanaphthol exerts a somewhat similar action,

and is also a valuable parasiticide. Precipitated sulphur may be employed in strengths of 10 to 12 per cent, best in benzoinated lard or a similar penetrating base. In warm weather, the ointment may be stiffened by the addition of a small amount of lanolin or paraffin. An excellent combination consists of sulphur, Peruvian balsam, prepared chalk, and green soap (5 to 10 per cent of each), in vaseline (Pusey). The balsam of Peru may be employed alone, simply by brushing it over the entire surface, and allowing it to remain over night; or it may be combined with the sulphur ointment in strengths of from 5 to 10 per cent. Betanaphthol (5 to 15 per cent) may be prescribed alone or with sulphur in the form of an ointment, or Kaposi's naphthol ointment may be employed. It consists of beta-naphthol 15 parts, precipitated chalk 10 parts, soft soap 50 parts, and lard 100 parts. Sherwell has found washed sulphur a convenient and valuable remedy. Each evening after the skin has been thoroughly cleansed, the entire body is rubbed lightly with the powder, and a small amount scattered between the sheets of the bed. The bed linen and the underclothing are changed every two or three days. A cure is usually effected in a week or ten days. In combating the disease in very young children, Knowles recommends the employment of a mixture of equal parts of styrax and olive oil, or a weak balsam of Peru ointment.

Scabies in the Lower Animals.—Many of the lower animals, particularly the donkey, mule, hog, dog and cat, as well as fowls, are subject to infection with various families of sarcoptes, or acari, and in rare instances the parasites may be transferred to man. The parasites do not thrive on human soil, however, and seldom penetrate the skin or multiply so rapidly as when confined to their natural habitat. The lesions are usually restricted to the covered portions of the body, and as a rule the malady responds favorably and promptly to the application of mild antipruritic remedies. The source of infection should of course be removed.

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PULEX PENETRANS.

Synonyms.—Chigger; Chigoe; Sand-flea.

This parasite, the Rhinochoprian penetrans, is indigenous to tropical America, and is occasionally encountered in the temperate zones. Anatomically it resembles the common flea, except that its proboscis is longer. As with the acarus scabiei, the impregnated female is the offender. The primary cutaneous lesions are burrows made by the parasite for the purpose of providing a resting place for herself during the period of maturation and extrusion of the ova. The opening is blocked by the last two segments of the body, which do not partake of the enlargement of pregnancy. The life cycle occupies a

Fig. 808.—Chigoe. The disease, which was contracted while the patient was working as a laborer in Mexico, involved the toes as well as the ankles, and had been present four months.

period of about twenty-five days. The parasite usually attacks the feet, particularly the toes, at the corner or beneath the free margin of the nail, the ankles, or the scrotum. As a result of secondary infection with staphylococci, extensive ulceration, and even gangrene, may supervene.

Treatment.—Immediately following exposure to infection a warm bath, with the liberal application of a strongly alkaline soap, will often prove prophylactic. The use of the essential oils likewise will serve as a preventive at times, and pyrethrum powder also is inimical to the parasites. If the female has already penetrated the skin, she may be removed with the aid of a blunt needle, and a tincture of iodine, or a mild ammoniated mercurial ointment, to which phenol or menthol (1 per cent), has been added, then freely applied to the wound.

LEPTUS.

Synonyms.—Harvest mite; Harvest bug; Mower's mite; **Trobidium** holosericum (Megrim).

This tiny animal, several varieties of which are recognized, is a common one in the temperate zones, and its attacks usually are credited to the much rarer chigoe. The parasite is brick-red in color, oval in shape, and measures from 0.3 to 0.5 mm. in length, and from 0.25 to 0.3 in breadth.

Symptoms.—The ankles and legs are the regions commonly involved, although the hands, arms, and axillae may be attacked. The parasite is most active during July and August, and occurs in

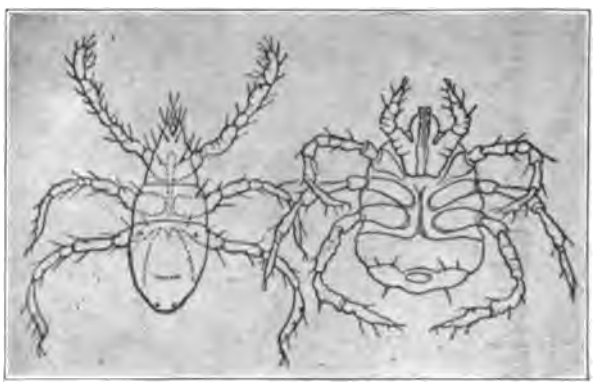

Fig. 809.—Harvest mite, male and female. (After C. V. Riley.)

enormous numbers in the grass and bushes, in fields, and in moist, swampy places. The lesions are of multiform character, but often present an urticarial aspect, and are always intensely itchy.

Treatment.—The prophylactic measures suggested under chigoe infection are applicable in this malady also. Weak parasiticidal ointments, to which an antipruritic has been added (phenol, 0.5 to 1.0 per cent), will prove both curative and comforting.

DRACONTIASIS.

Synonyms.—Guinea-worm; Dracunculus; Dracunculus medinensis.

Definition.—A disorder due to the presence in the human tissues of the female of a parasitic nematode worm of the genus dracunculus. The malady is a prevalent one on the West Coast of Africa and in

other tropical countries, especially Upper Egypt, India, Persia, and Guinea.

Symptoms.—The parasites while in the larval stage gain entrance into the body through the drinking water. After the development of the larvae, the female undergoes impregnation and begins her migrations through the tissues, but usually gives rise to no trouble until she has fully developed. The adult female worm averages 75 cm. or more in length, and about .2 cm. in diameter, and is milky white in color, with slightly convex head, and a pointed, hook-like tail. At the end of several months (nine to eighteen) she appears at some point beneath the epidermis where she may form a soft, spongy, cord-like mass. Oftentimes, however, the first premonition of her

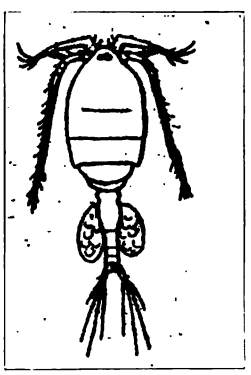

Fig. 810.—Cyclops, the intermediate host of Dracunculus. (Courtesy of Drs. W. A. Riley and O. A. Johannsen.)

presence is the appearance on the skin of a sharply circumscribed, pea-sized vesicle, accompanied or preceded by sensations of tension and itching. The lesion soon ruptures, and at the bottom of the cavity a large pin hole opening may be found, from which the head of the worm is frequently seen protruding. The parasites are usually single, but several or more may be present at one time. The usual site of escape is the foot or leg, although occasionally the hands or other parts of the body are involved.

Diagnosis.—A positive diagnosis can be made only by discovery of the offending nematode.

Prognosis.—As a rule the disease is a benign one, although Mercus and others have reported fatal cases, due either to the presence of large numbers of worms, or to unskilled or neglected treatment.

Treatment.—Horton has found large doses of asafetida curative,

and Forbes speaks highly of the internal use of sulphur. Emily's method, which has also been employed with satisfaction by others, consists of the injection into the worm itself or into the tumor mass, of an aqueous solution of bichloride of mercury (1 to 1,000). Twenty-four hours later the parasite can usually be extracted without trouble.

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Fig. 811.—Trichinosis, showing characteristic slit-like eyes and edema. (Courtesy of Dr. John W. Perkins.)

CYSTICERCUS CELLULOSA.

According to Geber, the occurrence of the hydatid of Tænia solium in the subcutaneous tissues of man was first noted by Rokitansky. The disorder is a not uncommon one in northern Germany, where much pork is eaten uncorned and half-raw. The lesions are pea- to

nut-sized, rounded or oval tumors, and are largest in those instances in which the animal is still living and giving rise to more or less irritation of the tissues. As a rule they are multiple, and when of long standing give rise to more or less pain. Ultimately, they may form abscesses, but usually they are absorbed, or undergo carcification. In arriving at a diagnosis the history of the case commonly is suggestive. The patients frequently complain of cramping pains in the extremities, fever of low grade usually is present, and the eyes are frequently narrowed and slit-like.

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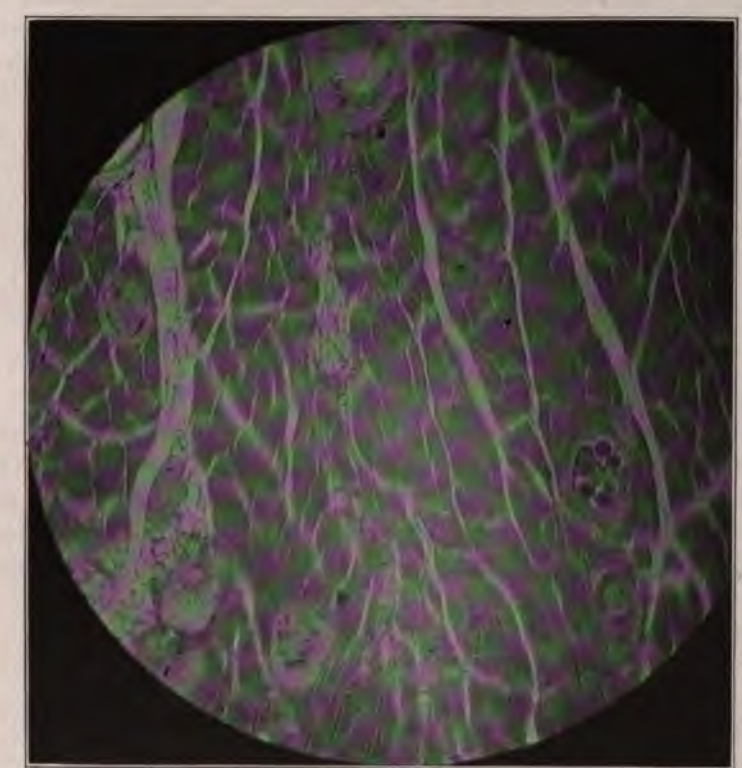

Fig. 812.—Trichinosis, showing parasite in subcutaneous tissue.

TRICHINA SPIRALIS.

The muscle form of this parasite, while not directly affecting the skin, frequently does give rise to edema and pain in the subcutaneous

regions, the character of which, if recognized, will lead to the diagnosis of the parent disorder. Infection generally occurs through the ingestion of raw, contaminated pork, but trichinae have also been observed in the cat, dog, rat, fox, badger, hedge-hog, and other animals.

UNCINARIAL DERMATITIS.

Synonyms.—Ground itch; Water itch; "Mazamorro."

Definition.—An inflammatory disease due to infection with the larvae of the Ankylostoma duodenale.

The affection is a not uncommon one in certain tropical countries, as Egypt, Southern Europe, Ceylon, Japan, Australia, South and Central America, and Porto Rico, and also is very prevalent in the Southern United States. The parent worm is a nematode of the family Strongylidae (Stiles), and the larvae, after gaining access to the body through the skin, or more rarely by way of the intestinal tract, later give rise to a serious systemic disorder, known as "hookworm disease." The larvae are found in moist, swampy and sandy districts which have become contaminated by feces, and individuals who habitually go barefooted are the most frequent victims of the malady, the toes and ankles being the favorite sites of attack. The earlier cutaneous lesions are erythematous macules, which quickly assume a papular, and later a vesicular or pustular aspect. The eruption is of irregular distribution, and is intensely itchy.

Treatment.—Aside from the adoption of prophylactic measures, consisting in the protection of the feet and legs from contact with infected soil and water, the treatment is essentially that of an acute dermatitis from any cause. The early application of an antiseptic, as spirits of turpentine, weak solutions of bichloride of mercury, or a 10 per cent aqueous solution of silver nitrate, has proved beneficial in some instances. Thymol internally, care being taken to advise the patient regarding the danger of the conjoint administration of alcohol, with calamine lotion, zinc oil, and similar applications locally, constitutes the best plan of treatment in cases of longer standing.

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TRYPANOSOMIASIS.

Definition.—An affection due to the invasion of the body by a flagellate blood parasite, the Trypanosoma gambiense, which gains entrance probably through the medium of the tsetse fly.

Symptoms.—Trypanosomiasis is a disease of warm countries, and is seldom encountered outside of the tropics. The primary lesion, due to the bite of the insect, is usually located on the legs, knees, or neck, and is characterized by signs of intense local irritation, which at times may assume the aspect of a severe, but non-suppurative, lymphangitis. There is occasional associated involvement of the neighboring lymphnodes. These symptoms gradually subside, but later in the disease other cutaneous manifestations, as circinate erythematous patches, wheals, vesicopapular and papular lesions, may occur.

Treatment.—Arsenic, and particularly the newer preparations, arsphenamine and neoarsphenamine, and sodium salvarsan, is the most effectual remedy. Locally the treatment is largely symptomatic.

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DEMODEX FOLLICULORUM.

Synonym.—Acarus folliculorum.

This minute animal parasite was first described by Henle and Simon in 1841-42, and occurs singly or in numbers in the hair follicles of the face, and in the ducts of the sebaceous and Meibomian glands. Children under one year of age are seldom affected, but in adults, Hausche found it in almost 80 per cent, and Joers in 64 per cent of the cases examined. The female parasite is about 0.4 mm. long, the male 0.3. The thorax is armed with eight short, stubby legs, and the head possesses a snout and two feelers. It is extremely doubtful whether the presence of the animal ever gives rise to inflammatory changes, although the parasite has been credited by de Amicis, Dubreuilh, and others with causing a tinea versicolor-like discoloration of the skin.

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MYIASIS CUTANEA.

In tropical and subtropical countries, and occasionally in the temperate zones, the skin is invaded by the larvae of certain flies, particularly those of the families of muscidae and œstridae. The former deposits its eggs on the surface of open wounds, as burns, and other suppurating granular surfaces, and the latter punctures the skin, and inserts its ova immediately beneath the surface, where they develop and give rise to furuncle-like lesions which ultimately break down and allow the larvae to escape. Yount and Sudler have reported an extremely interesting example of intranasal infection from the screw-worm fly, and cite a number of other similar cases. Singleton, of Galveston, has recently reported an interesting case of *Dermatobia noxialis* ("Macaw worm"), in a German laborer. The lesion occurred on the shaft of the penis. Dyer has described a case occurring in a bedridden old man, the ulcers being located on the leg. King, of the Bureau of Entomology, identified the flies as Lucilia caeser, L. pilatei, and L. sericata.

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CRAW-CRAW.

Craw-craw is a native term employed on the West Coast of Africa to designate a scabies-like condition which is characterized by multiform lesions, and intense itching. Nielly believed the condition to be a result of nematode infection, and O'Neill concluded that it was due to a variety of filaria. Castellani and Chalmers limit the term craw-craw to an infectious disorder which is characterized by an itchy, papular eruption, and which usually is confined to the limbs. Aside from the use of antiseptics, as sulphur, bichloride of mercury and lysol, the treatment is symptomatic.

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CREEPING ERUPTION.

Synonyms.—Larva migrans; Dermamyiasis linearis migrans œsteosa.

This peculiar affection, first described by Lee, in 1874, is characterized by the presence on the skin of a narrow, somewhat elevated, tortuous, thread-like line, which is whitish or pinkish in color, and

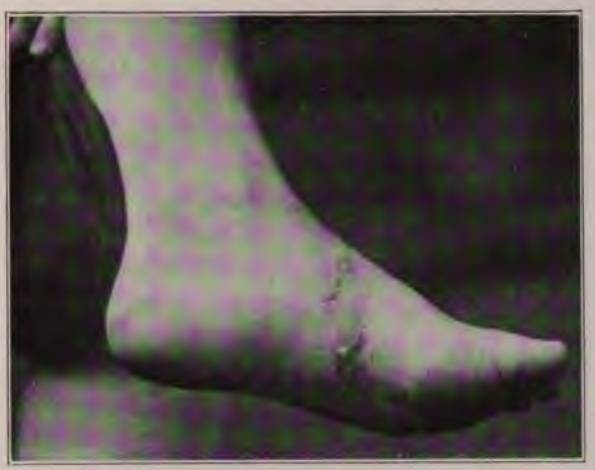

Fig. 813.—Creeping eruption. (Courtesy of Dr. J. B. Shelmire.)

Fig. 814.—Larva migrans in a healthy boy eighteen months old. (Courtesy of Dr. Grover W. Wende.)

marks the course of the migrations of an immature gastrophilus larva, lying within or just beneath the horny layer. The tunnel made by

the parasite is from 0.2 to 0.3 cm. in diameter, and varies in length with the distance traveled by the animal. Ordinarily the larva moves at the rate of from 1. to 10. cm. per day. In some instances, as in Haase's case, it travels only at night.

The malady is a fairly common one in certain parts of Russia and Arabia, and probably is not so rare as is generally supposed in this country, typical examples having been reported by Stelwagon, Ham-

Fig. 815.—Larva Gastrophilus, showing a newly-made burrow. The oval body, with the club-like central projection, in the central and lower portion of the burrow. Low magnification. (Courtesy of Dr. Frank Crozier Knowles.)

burger, Shelmire, Hutchins, Moorehead, Knowles, Parham, Edwards, Kirby-Smith, Howard Fox, Lee, King, Gray, and others. Both Bokaloff and Koschewnikow have identified the larva as that of a bot-fly (Œstridae) of the horse, genus Gastrophilus, probable species Haemorrhœdalis.

Larbish, or Oerbiss, is a form of Creeping Eruption, also probably due to the presence of dipterous larvae under the skin. It was first described by Béringer-Féraud in 1875, and the causative agent is

at present unknown. A case has recently been reported by MacFie.

Treatment.—Injections of chloroform were successfully employed by Hutchins. Stelwagon cured all of his cases within a week by ionization with bichloride of mercury, and the application of a minute quantity of nitric acid to the suspected site of the parasite, just beyond the extreme end of the line.

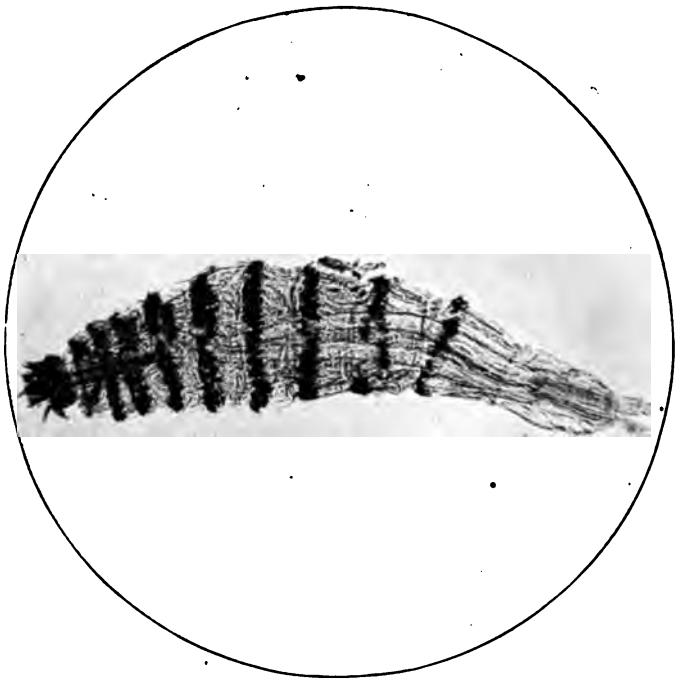

Fig. 816.—Larva Gastrophilus. Low magnification. (Courtesy of Dr. William Allen Pusey.)

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ECHINOCOCCUS.

In rare instances the echinococcus larva may attack the subcutaneous tissues of man, giving rise to walnut- to apple-sized, semi-trans-

lucent, cystic tumors. The overlying skin is unaffected. Aside from the tension and pressure to which its presence sometimes gives rise, the lesions are painless. Women are attacked more frequently than men. The parasite usually dies at the end of one or two years, and the contents of the cyst may undergo atrophy, saponification, or calcification. The diagnosis can be verified only by exploratory puncture. The treatment is surgical.

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2. DISEASES DUE TO FUNGI.

TRICHOPHYTOSIS.

Synonyms.—Ringworm; Dermatomycosis trichophytina.

Definition.—Trichophytosis, or ringworm, is a local infectious disease of the skin, hair or nails, produced by a vegetable fungus. The parasitic nature of the disorder was first demonstrated by Gruby, in 1842. Gruby's observations were confirmed by Bazin, a few years later. More recently the character of the various causative fungi has been exhaustively investigated clinically and bacteriologically by a number of observers, chief among whom has been Sabouraud, of Paris.

Sabouraud at first based his classification of the fungi upon their size, and their arrangement with respect to the hair shaft, and their comparative resistance to standardized solutions of potassium hydrate. He concluded that two main types existed, a small-spore variety (microsporon), and a large-spore variety (megalosporon). The microspora are divided into two main groups, those of human origin, of which the *M. audouini*, and the *M. tardium* are the most common, and those of animal origin, of which the *M. lanosum* is probably the most important. The megalospora can be divided and subdivided, according to the localization of the fungi with relation to the surface of the hair shaft, and the resistance of the spores, as follows:

- Megalosporon
  - M. endothrix (inside the hair shaft).
    - A resistant variety (practically unaffected by KOH).
    - A non-resistant variety (easily affected by KOH).
  - M. ectothrix (outside the hair shaft).
    - Small spore (microspora).
    - Large spore (megalspora).

Occasionally fungi are found both on the surface, and in the interior of the shaft. For this type the designation "endoectothrix"

has been adopted. By the employment of the elaborate culture methods devised by Sabouraud, the various molds have been divided and subdivided into an almost endless number of groups, only a few of which can be mentioned here. Of the various numbers of the megalosporon endothrix group, the *T. crateriforme* (resistant), the *T. acuminatum* (fragile), and the *T. violaceum* (resistant) are the most frequently encountered, and of the megalosporon ectothrices, the *T. asteroides* is the most common of the microid types, and the *T. rosaceum* of the megalospora types.

The character of the clinical manifestations varies with the type

Fig. 817.—Trichophyton endothrix. Magnification 1000 diameters. (Courtesy of Dr. B. Barker Beeson.)

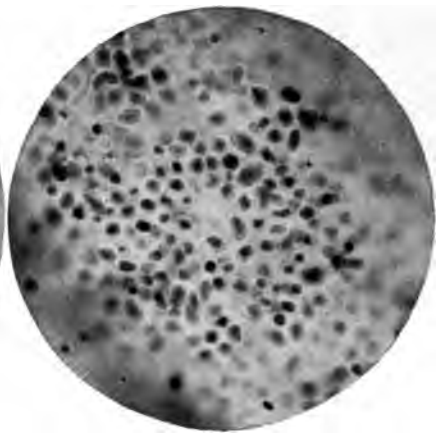

Fig. 818.—Microsporon Audouini. Magnification 1000 diameters. (Courtesy of Dr. B. Barker Beeson.)

of organism present, and with the part or region involved. For purposes of description, the symptoms can best be discussed under regional headings.

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TINEA TRICHOPHYTINA CORPORIS.

Synonyms.—Ringworm of the body; Tinea circinata; **Trichophytosis corporis.**

Fig. 819.—Ringworm of the glabrous skin in a child.

Fig. 820.—Ringworm of the axilla.

Symptoms.—Ringworm of the glabrous skin usually **begins as a** flattened, reddish papule. The lesions tend to spread **peripherally,**

and clear up in the center. In the course of a few days a ring-like patch is formed, the central portion of which is pinkish or reddish in color, with a smooth or slightly furfuraceous surface. The margin of the plaque is sharply defined, and is slightly elevated, actively inflamed, and more or less scaly and in places vesicular. The circinate

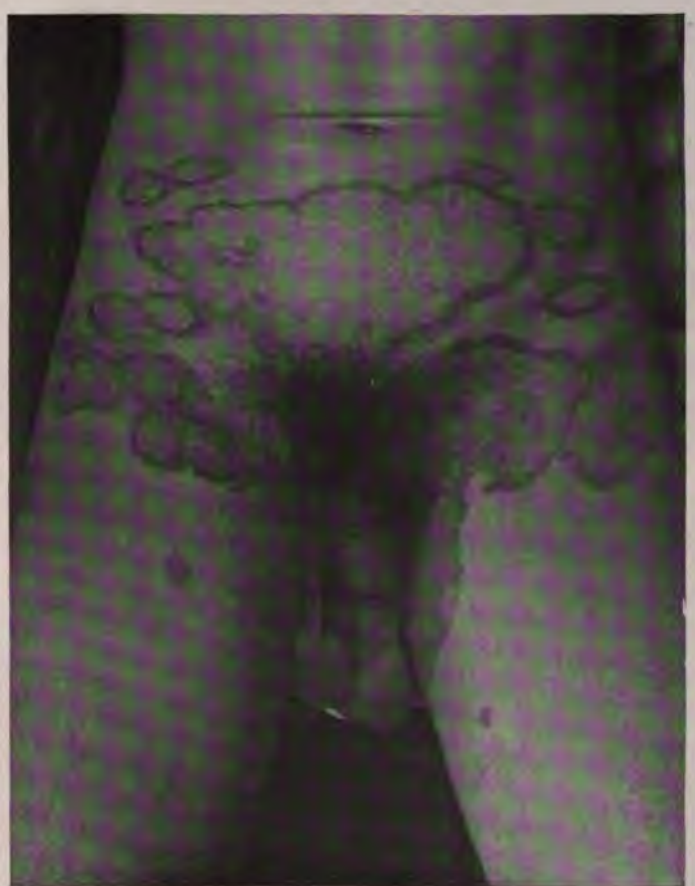

Fig. 821.—A case of so-called "eczema marginatum," due to ringworm. (Courtesy of Dr. M. L. Heidingsfeld.)

lesions gradually increase in size until a diameter of 5.0 to 10.0 cm. or more is reached. They then remain stationary for a few days, and may disappear spontaneously, leaving no trace. Occasionally two or more patches may coalesce, giving rise to polycylic or gyrate figures. In some instances the tendency to central involution is less marked or

Fig. 822.--Ringworm of palm. Localized intertriginous and palmar type. **Fungi + + +.** (Courtesy of Drs. Ormsby and Mitchell.)

Fig. 823.--Ringworm of palm. Unilateral. Organism found.

even wholly wanting, and the eruption may consist partially or entirely of several or more, solid, pinkish, reddish or brownish, scurfy, ill-defined, rounded or oval patches. As a rule the lesions vary in number from a few to a dozen or more. Itching and burning of slight

Fig. 824.—Ringworm of sole. (Courtesy of Drs. Ormsby and Mitchell.)

Fig. 825.—Ringworm of sole, showing desquamation in a case of the vesicular type following the use of the salicylic and benzoic acid combination. (Courtesy of Drs. Ormsby and Mitchell.)

degree may be present, but subjective symptoms are seldom a prominent factor of the disease.

The sites of predilection are the uncovered surfaces of the body, as the face, neck and hands. Occasionally the palms are attacked,

Fig. 826.—Ringworm of palm. Intertriginous areas also involved. (Courtesy of Dr. J. E. Lane.)

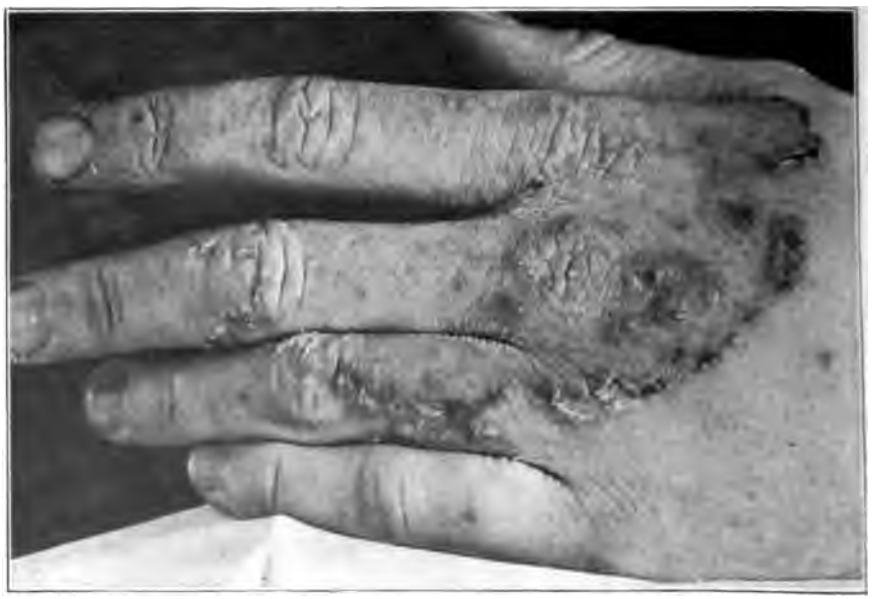

Fig. 827.—Ringworm of hand. (Courtesy of Dr. Geo. M. MacKee.)

and sometimes the disease is limited entirely to this region, as Pusey, Ravogli, Pickett, and others have stated. The disease may involve the soles and interdigital spaces also, as in the cases described by Stelwagon, and by Ormsby and Mitchell. According to Sabouraud, the *T. violaceum* and the *T. acuminatum* are usually the offenders in these regions. The mucous membranes usually escape, although Robinson and others have noted instances in which they were involved. In the severe types of the disorder, which are due

Fig. 828.—Ringworm of the palm. (Courtesy of Dr. William Allen Pusey.)

Fig. 829.—Agminate folliculitis, due to large-spored ringworm. (Courtesy of Dr. M. L. Heidingsfeld.)

either to infection with a more virulent type of fungus, or to a greatly lowered resistance on the part of the patient, the patches may assume a papulopustular, or even a kerion-like, carbunculoid aspect *(agminate folliculitis)*. Lesions of this type are usually few in number, and develop most frequently on the dorsal surface of the hand or forearm. Clinically, they appear as slightly elevated, rounded or oval, boggy swellings, the underlying epidermis being perforated by numerous follicular openings from which serum and pus

exude. In "*granuloma trichophyticum*" or "*hyphomycetic granuloma,*" the inflammatory process is largely confined to the deeper structures, with resultant formation of indolent nodules and plaques and the subsequent development of granulomata. A peculiar papular or lichenoid type of trichophytosis has been described by Guth and others. The lesions are reddish papules, and are usually located on the trunk or legs. Children only are attacked. The offending fungus is probably the *T. gypsicum.*

TINEA TRICHOPHYTINA CRURIS.

Synonyms.—Tinea cruris; Eczema marginatum; Dhobie itch.

This clinical variety of the disorder, which is also observed in the axillae, is usually if not always due to a special fungus, the *Epidermophyton inguinale* (Sabouraud). This organism resembles the trichophyton in many respects, and Castellani and Chalmers state that several varieties *(E. inguinale; E. rubrum; E. perneti)* of it probably exist in various parts of the world.

Clinically, the affection is characterized by a sharply defined inflammatory process which is usually limited to the genitocrural regions. The earlier manifestations may simulate those of an acute intertriginous eczema, or a simple intertrigo. Usually, however, the primary eruption consists of a few or several superficial circinate patches, which sooner or later coalesce to form solid, symmetric, bat-wing-shaped, inflammatory areas, with sharply defined, slightly elevated borders, on the inner surfaces of the thighs, contiguous to the scrotum. The margins may be straight, but usually they present a festooned appearance, with more or less infiltration. Females are occasionally attacked as well as males. In the former the vulvar mucosa sometimes is involved. Occasionally, in both sexes, the umbilical region also is affected.

Dhobie itch (washerman's itch) is an allied affection, occurring in tropical and subtropical countries. Owing to the heat and the associated moisture from sweating, the symptoms are greatly aggravated, and as a result of violent scratching, the parts soon become raw and inflamed. Secondary pyogenic involvement, with resultant impetigo and even furunculosis, is not uncommon. Stitt believes that in some cases of dhobie itch the severity of the disorder is greatly intensified by a symbiosis existing between the infecting mold and a coccus. In the midst of the mycelia he frequently observed areas studded with staphylococci. Whether the symbiosis increased the

virulence, or whether the cocci facilitated the extension of the mold, Stitt was unable to conjecture.

Whitfield, Sabouraud, and others have called attention to a disorder which occasionally occurs on the feet or hands, and likewise is due to the *Epidermophyton inguinale*. Whitfield describes both acute and chronic types of the malady. In the former the eruption may simulate vesicular eczema, but the chronic and usual forms are characterized either by soddenness and exfoliation of the corneous

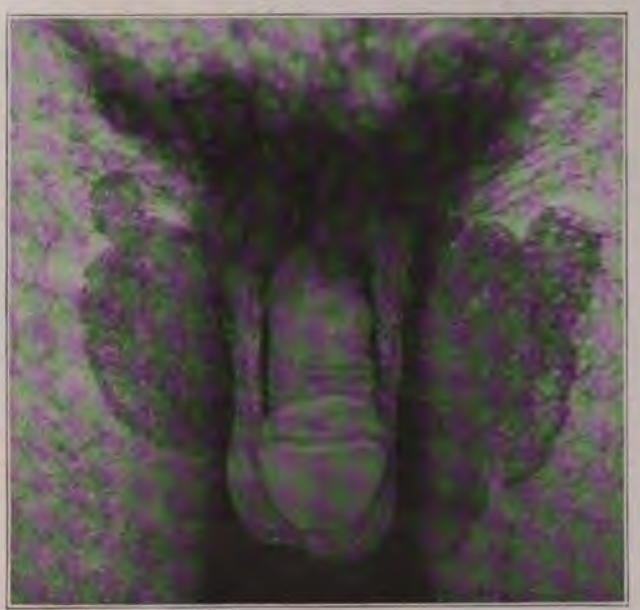

Fig. 830.—Tinea trichophytina cruris.

layer on the lateral surfaces and the webs of the toes, or by well-defined hyperkeratosis of the soles and palms, occasionally with some associated pustulation. Both the acute and intertriginous types give rise to intense itching.

Diagnosis.—Ringworm of the general surface is to be differentiated from pityriasis rosea, seborrheic dermatitis, and psoriasis. In tinea trichophytina the distribution, history and course of the lesions is usually distinctive. In doubtful cases, a few scales may be removed from the margin of a lesion, mounted in a 10 percent. aqueous solution of potassium hydrate, and examined microscopically. The

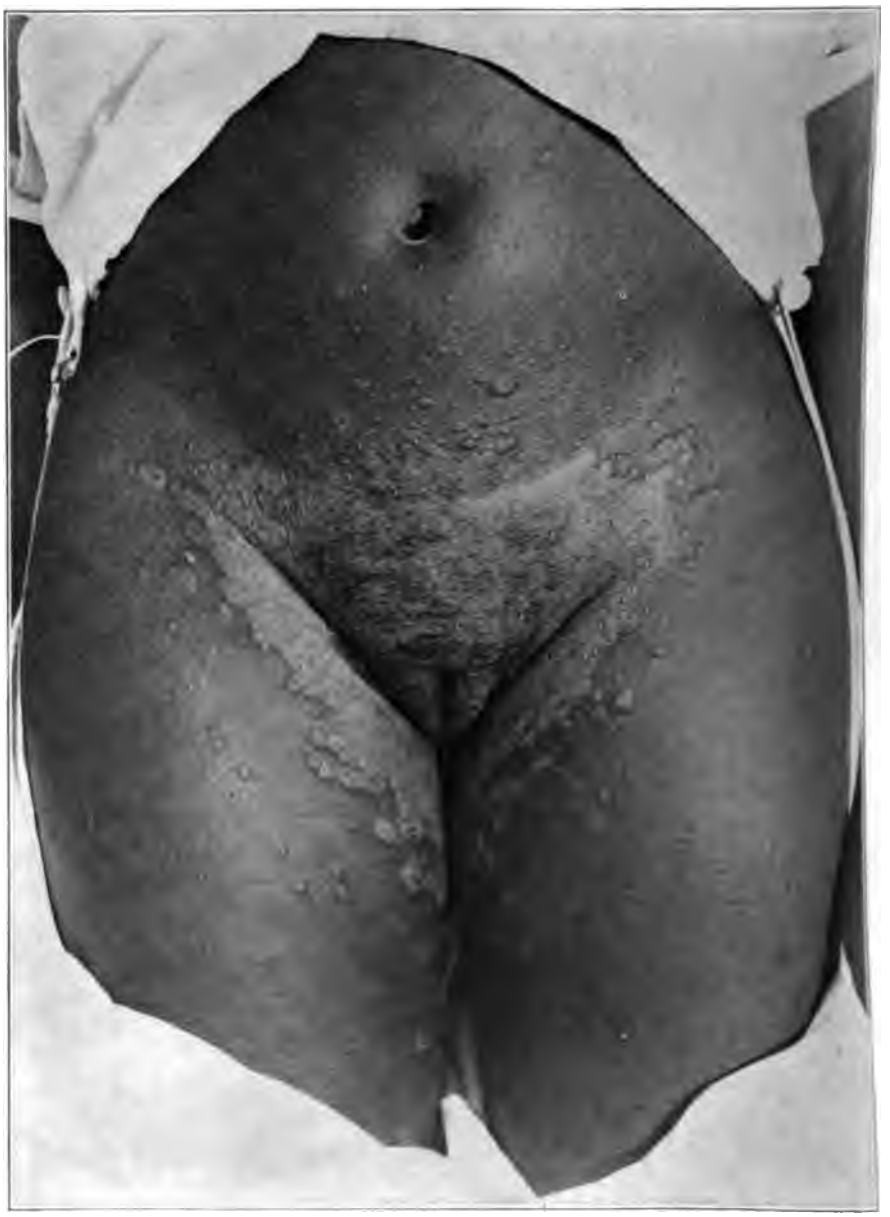

Fig. 831.—Eczematoid ringworm. (Courtesy of Dr. Geo. M. MacKee.)

presence of the pathognomonic mycelia and spores will of course prove confirmatory.

In pityriasis rosea the eruption is usually confined to the trunk, and commonly begins with the appearance of a "mother spot" in one of the lower abdominal quadrants. The lesions are numerous. They develop quickly, and pursue a relatively rapid course. Fungi are absent. In seborrheic dermatitis, the sternal and interscapular regions generally are first affected. The lesions, while often circinate, are usually irregular and ill-defined, and the scales are unctuous and greasy. Vesicles and pus are never present. Psoriatic lesions are at times ring-like, but are always dry, and never acutely inflammatory. On scraping off the superficial scales, the typical bleeding points are exposed. The distribution of the eruption also is more or less characteristic.

The localized types of deep infection may be mistaken for carbuncle.

Tinea trichophytina cruris may be confused with eczema, dermatitis seborrheica and erythrasma. The localization and character of the eruption, its history, and the frequent presence of satellite lesions should serve for recognition. In obscure cases, recourse may be had to a microscopic examination of scales from the margin of the patch. In erythrasma, the patches are superficial, and very slightly inflammatory. Microscopically the fungus is readily differentiated from the *E. inguinale.*

Eczematoid ringworm of the extremities is less readily diagnosticated, and it is extremely probable that many cases go unrecognized. The presence of a stubborn and resistant intertriginous dermatitis should always arouse suspicion. A positive diagnosis is wholly dependent, however, upon the discovery of the fungus.

TINEA TRICHOPHYTINA CAPITIS.

Synonyms.—Tinea capitis; Tinea tonsurans; Ringworm of the scalp; Herpes tonsurans.

Symptoms.—Ringworm of the scalp is usually a disorder of childhood. The earliest appreciable lesion is a minute, rounded scaly patch, or a red, hair-perforated papule. The base of the lesion is reddened and hyperemic, but the scales are whitish or grayish in color. As the patch slowly increases in diameter, there is no tendency to central involution such as occurs in lesions on the glabrous skin. The in-

volved hair shafts become dry, lusterless and brittle, and in the course of a few days or weeks the patch bears a rough, but striking, resemblance to a "picket area" located in tall, dry grass. The loss

Fig. 832. Disseminated small-spored ringworm of scalp. (Courtesy of Dr. George M. MacKee.)

Fig. 833.—Small-spored ringworm of the scalp.

of hair is rarely complete, and in the older patches, young, lanugo-like shafts are intermixed with the dead and broken stumps. Occasionally the inflammatory process may be so acute as to give rise to

vesiculation and pustulation. The patches vary in size up to a diameter of several centimeters or more. As a result of coalescence, diseased areas of considerable extent may be formed. Itching of variable degree may be present.

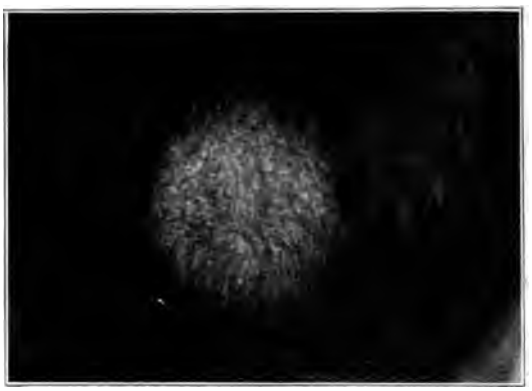

Fig. 834.—Large-spored ectothrix ringworm of scalp.

Fig. 835.—Extensive case of ringworm of the scalp. The hair has been clipped. Practically every shaft is diseased. (Courtesy of Dr. George M. MacKee.)

Several clinical types of ringworm of the scalp are recognized. Aldersmith has suggested the designation of "disseminated ringworm" for those cases presenting small scattered patches of the disease. "Black-dot ringworm" is so called because of a tendency exhibited by the hairs in some instances to break off flush with the

follicular orifices. While few agree with Hutchinson that alopecia areata is a sequel of ringworm, Crocker, Liveing, Dubreuilh and Freche, Hartzell, and others have described cases of tinea trichophytina capitis in which the patches were quite bald, and clinically almost indistinguishable from those due to alopecia areata. Dubreuilh and Freche believe that this type, "bald ringworm," is often due to a resistant form of the *T. endothrix,* a fungus which is quite common in Bordeaux.

In a study of 100 cases of ringworm of the scalp in Chicago, Beeson found that 89 per cent belonged in the microsporon group, and 11 per cent in the large-spored group. In the latter group, there were seven cases of endothrix infection, and four of ectothrix. Weiss has recently

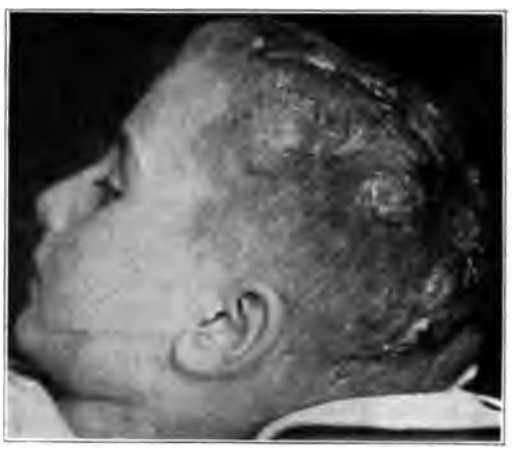

Fig. 836.—Multiple kerions in a case of ringworm of the scalp. (Courtesy of Dr. Joseph Lamb.)

reported a case of epidermophyton infection of the scalp in a man of 27.

Tinea kerion, or *Kerion celsi,* is a deep-seated, acutely inflammatory process which results in the formation of a rounded, boggy, carbuncle-like tumor. The surface of the lesion is reddish or purplish, and is marked by numerous, pinhead- to split-pea-sized pustules, and gaping follicular orifices. The subcutaneous tissue is honeycombed, and filled with purulent matter, small amounts of which can be squeezed out through the follicular openings. The tumors may be either single or multiple. They are extremely sensitive to pressure, and may give rise to a considerable amount of pain. In a case referred to me by Dr. Lamb, of Adams, Nebraska, the scalp exhibited nine

well-defined lesions of this character at one time, and on several occasions there was, in addition to the pronounced subjective symptoms, an evening rise of temperature of more than 3° F. As a result of the long continued inflammatory reaction, with its ensuing symptomatic but transient alopecia, this type of the disorder may undergo spontaneous cure.

Diagnosis.—The symptoms of an uncomplicated case of ringworm of the scalp are characteristic and easy of recognition. The age of the patient (adults are so rarely attacked that the probability of such a contingency may safely be ignored), the presence of partially bald, well-defined, scaly areas, marked by lusterless, brittle or broken hairs, and dilated or débris-stuffed follicular orifices, are pathognomonic. The affection is to be differentiated from seborrheic dermatitis, favus, eczema, and, rarely, alopecia areata. In doubtful cases, recourse should be had to a microscopic examination of several or more freshly epilated hairs. In preparing the material for examination a clear, aqueous solution of potassium hydrate (15 to 20 per cent) may be employed. With an alkali of this strength the hair clears quickly, but does not disintegrate so rapidly as when exposed to the action of strong solutions.

For the preparation of stained specimens, I have found Brongersma's method the most satisfactory. The diseased stump is put on a slide, and washed with ether, to get rid of the fat. It is then treated with aniline gentian-violet solution for 5 minutes, blotted, treated with potassium iodide iodine solution for from 1 to 5 minutes, blotted, treated with aniline oil, then a mixture of equal parts of aniline oil and dilute hydrochloric acid, to decolorize, and, finally, aniline oil, followed by xylol, and mounted in balsam.

In order to study the finer points of differentiation it is necessary to resort to cultivation-experiments, a subject which is beyond the scope of a work of this character, but which is exhaustively discussed in Sabouraud's classical book, "Les Teignes."

TINEA TRICHOPHYTOSIS BARBAE.

Synonyms.—Tinea barbae; Tinea sycosis; Trichophytosis barbae; Ringworm of the beard; "Barbers' itch."

Symptoms.—Two distinct clinical types of ringworm of the beard are recognized—a superficial and a deep. Both varieties generally begin in a manner very similar to that exhibited by the disease when

located on the glabrous skin. In the superficial form the process may involve a few or several of the hair shafts to a greater or less extent, but seldom to the degree seen in tinea trichophytina capitis. The affected hairs become harsh, dry and brittle, and can usually be readily extracted, the diseased root-sheath often remaining adherent to the base of the shaft. The skin is slightly reddened and somewhat thickened, and there is more or less scaling, with slight associated itching. Vesiculation and pustulation commonly are absent. Not infrequently the disease remains superficial throughout its course, hair involvement being slight or entirely lacking. In a considerable percentage of instances, however, the deeper structures are implicated, either from the beginning of the attack or after the disease has been present for several days or weeks in the superficial form. The ensuing lesions may be few or many in number, and consist of flat, or oval-topped, reddish, kerion-like tumors, the surfaces of which are studded with dead or broken hairs, or by gaping follicular orifices. As a rule, the nodules ultimately break down in the center,

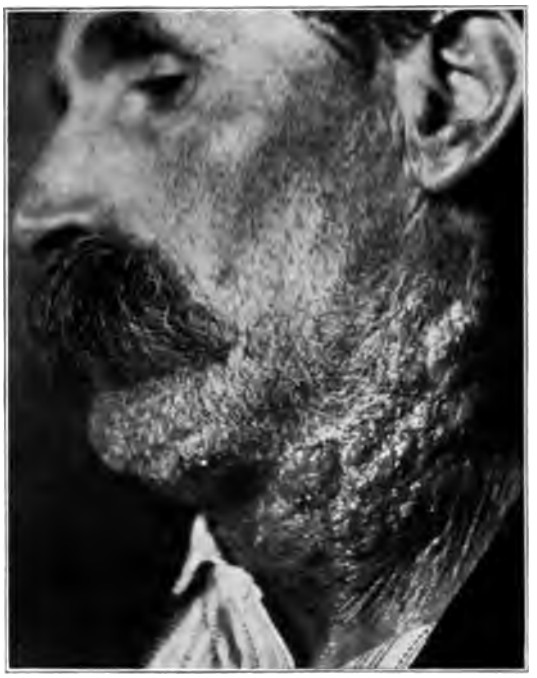

Fig. 837.—Ringworm of the beard. (Courtesy of Dr. J. Archie Robertson.)

and pus or seropurulent matter is discharged through the dilated follicular openings. The most common sites for the lesions are the under surface of the jaw and the cervico-maxillary folds. In rare instances the entire bearded region may be involved, but as a rule the upper lip escapes. The severe form of tinea barbae usually develops slowly and is very sluggish in its course, with little or no tendency to spontaneous healing.

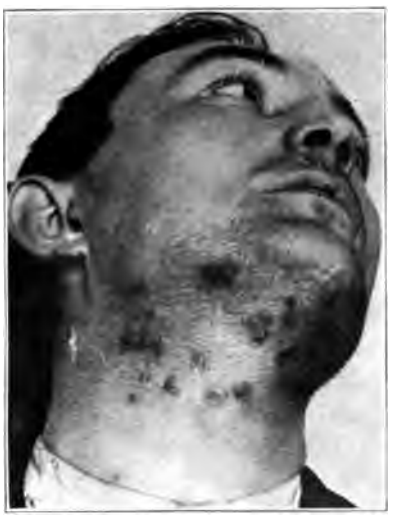

Fig. 838.—Ringworm of the beard. (Courtesy of Dr. M. L. Heidingsfeld.)

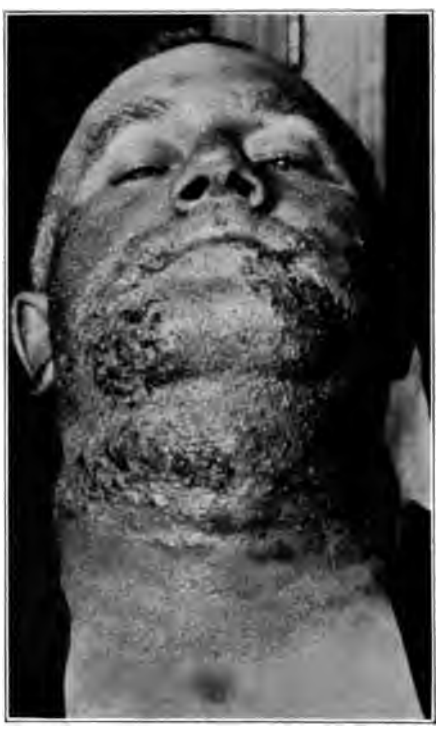

Fig. 839.—Ringworm of the beard. (Courtesy of Dr. E. Wood Ruggles.)

Diagnosis.—The disease is to be differentiated from seborrheic dermatitis, eczema, the circinate syphiloderm, and sycosis. In both seborrheic dermatitis and eczema the process is superficial, and the hair shafts are never involved. Syphilis gives rise to more or less tissue destruction, with resultant scarring and pigmentation. The characteristic lesions of sycosis are superficial, hair-pierced pustules or papules, the shafts seldom drop out spontaneously, and the upper lip is generally involved early in the course of the attack. In doubt-

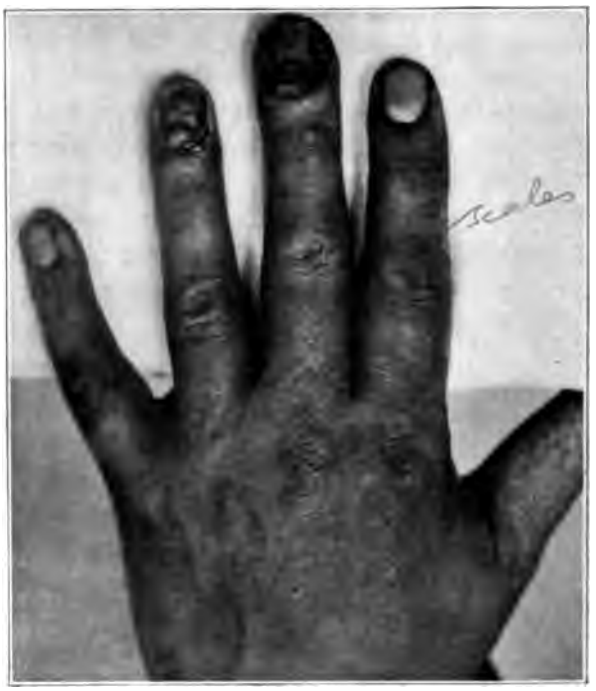

Fig. 840.—Ringworm of nails. (Courtesy of Dr. J. E. Lane.)

Fig. 841.—Ringworm of nails, enlarged photograph. (Courtesy of the U. S. Public Health Service, Immigrant Hospital, New York City.)

ful instances recourse may be had to a microscopic examination of the diseased hairs. Rarely in the deep type of the malady the lesions simulate carbuncle, and in one case under my observation a diagnosis of actinomycosis had been made.

Etiology and Pathology.—Ringworm is comparatively a common disorder, although less so in America than in Europe and Great Britain. During the past year, an epidemic of ringworm due to the Trichophyton rodens (a microid ecto-endotherix of the Gypseum group) has been reported from New South Wales by Paul; and one due to the Epidermophyton inguinale from Galveston by

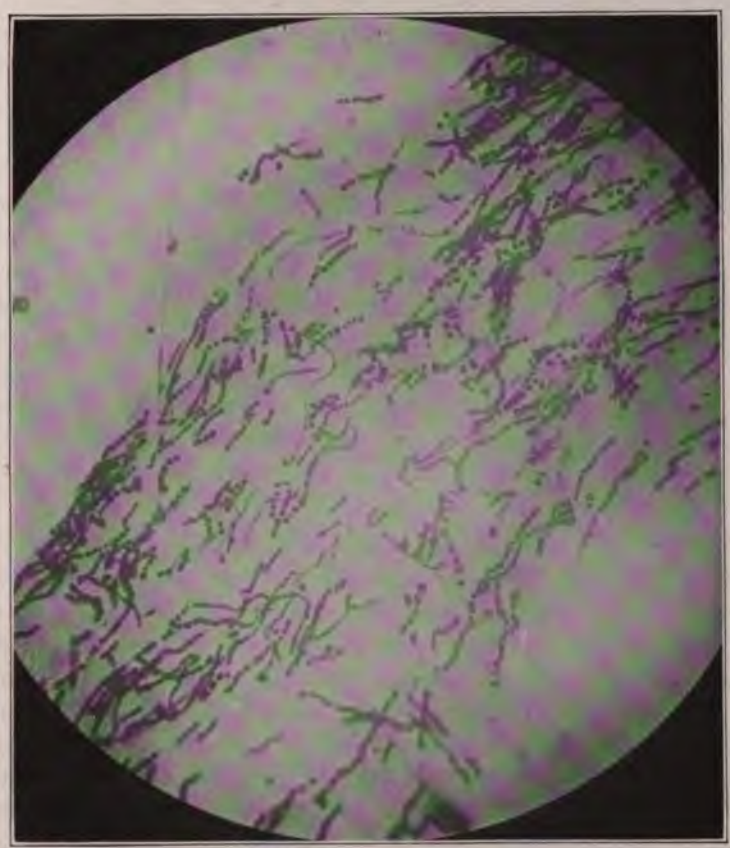

Fig. 842.—Megalosporon endothrix, from a case of tinea trichophytina capitis. Moderate magnification.

Boyd. Infection may occur by direct contact, or through the use of contaminated articles, particularly hats, underwear, combs, brushes, etc. The affection exists in animals as well as in man, and not infrequently the disease is contracted from association with infected cats, dogs, horses, cattle, and even birds. The large-spored ectothrices are usually of animal origin, and are slightly less infectious

than either the microspora or the endothrices. These fungi generally give rise to lesions which are markedly inflammatory in character. Certain individuals are apparently more susceptible than others, possibly for the same reason that many persons commonly exhibit a low resistance to infection with the staphylococcus and similar micro-organisms. Ringworm of the scalp is practically limited to children, although authentic cases in adults have been observed by Stelwagon, Duhring, Abraham, Sequeira and Oliver, and others. The offending fungus in the adult is usually the large-spored endothrix, although in Sequeira and Oliver's case it was the microsporon felineum. As observed in this country, ringworm of the scalp is generally due to infection with the small-spored fungus. White found this organism to be causative in 88 per cent of his Boston cases, and Corlett in 90 per cent of those seen in Cleveland. The fungi gain entrance into the hair shaft probably through the action of a proteolytic enzyme which they produce, and which is capable of liquefying gelatine (McFayden). The histopathology varies considerably with the type of fungus present, and with the duration of the disease. Hyperkeratosis, edema, papillary congestion, and vascular dilatation commonly are present. In the deep-seated types, cellular infiltration (plasma-cells and leucocytes) occurs, and in aggravated instances true granulomata may form.

Prognosis.—The prognosis varies with the location, extent, and duration of the disease. When involving only the glabrous skin, the affection responds readily and favorably to treatment. In the axillary and bearded regions the outlook is somewhat less favorable, in so far as immediate results are concerned, while in long standing and extensive cases of ringworm of the scalp the malady usually proves extremely rebellious and obstinate, and many weeks or even months of energetic treatment may be required to eradicate the infection. Ringworm of the scalp in very young children is more amenable to treatment. The acutely inflammatory varieties tend to get well more rapidly than the sluggish types, although in those instances characterized by kerion formation localized areas of baldness due to scarring may persist. Great caution must be exercised in conducting the final examination of a case before discharging it as "cured." The presence of scaly or scurfy spots of any kind, or of dead or lusterless hair shafts should always arouse suspicion, and lead to further microscopic search for fungi. The conscientious employment of an antiparasitic application for several weeks after the

child is apparently well often is necessary to safeguard against relapses, as well as to protect the associates of the patient.

Treatment.—Aside from the adoption of measures which are calculated to increase the general resistance of the patient, ordinary constitutional remedies are of little or no value in the treatment of ringworm. Recently Strickler, Engman and McGarry, and others have employed vaccine therapy in several instances, with promising results. This plan of treatment is based on the fact that in the blood of individuals whose skins are infected with the disease there exists a specific antibody, which is capable of producing a complement fixation test. Con-

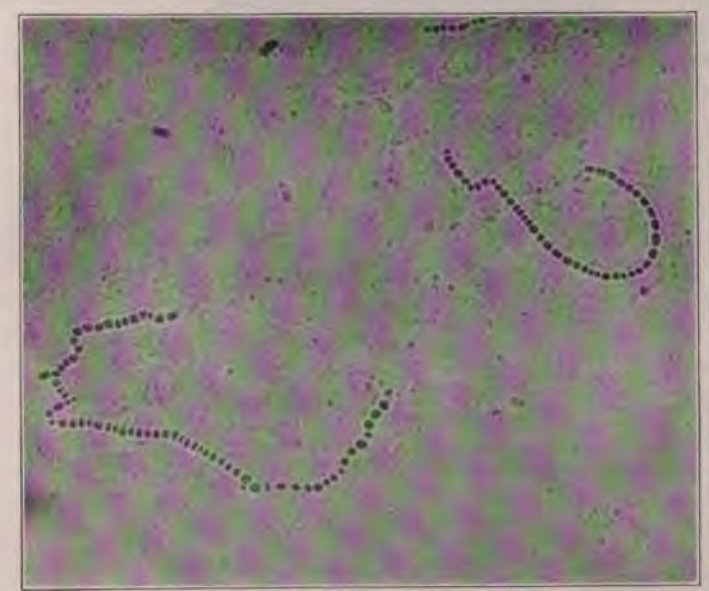

Fig. 843.—Fungus from a case of ringworm of the nails. X 330. (Courtesy of U. S. Public Health Service, Immigrant Hospital, New York City.)

sequently, sterilized cultures of the fungus can be employed for diagnostic purposes (in the same manner that tuberculin and luetin are used), as well as for treatment. Strickler states that the success of the method is largely dependent upon the manner in which the vaccine is prepared. He and Kolmer triturate the culture growths with chemically pure sodium chloride, and then add enough sterile distilled water to make a normal saline solution. The vaccine is heated for one hour at 60° C., and 0.25 per cent of phenol added as a preservative.

Ringworm of the general surfaces as a rule responds favorably to any of the stronger parasiticides. If the skin is not too irritable, daily applications of tincture of iodine for a period of four or five days generally prove curative. Ammoniated mercurial ointment (5 to 10 per cent) also serves admirably at times, or an ointment containing tar (10 per cent), or sulphur (5 to 10 per cent) may be prescribed. If extensive areas are involved, an aqueous solution of sodium hyposulphite (10 to 20 per cent) alone, or followed by an

Fig. 844.—Microsporon. High magnification. The location of the fungus in the hair shaft is unusual. (Fox and Blaxall.)

aqueous solution of tartaric acid (3 per cent), often acts well. The hyposulphite-acid combination results in the formation of nascent sulphurous acid, and is highly recommended by Crocker.

In ringworm of the crotch and of the axillae, it often is necessary to employ soothing remedies, as Anderson's antipruritic powder, calamine lotion, and similar preparations, at first, and antiseptics later. Of the latter, an aqueous solution of sodium hyposulphite (10 to 15 per cent) is one of the best, although carbolized solutions of resorcin (2 to 10 per cent), and mild, parasiticidal ointments (ammoniated mer-

cury, sulphur and salicylic acid) sometimes act well. Occasionally it is desirable to paint the margins of the patches with a strong parasiticide, as tincture of iodine, solutions of mercuric chloride (.5 to 1 per cent), or formalin, and follow this procedure by the application of soothing lotions and bland ointments. In the long standing, severe cases, marked by much infiltration, an ointment containing chrysarobin (2 to 10 per cent) often proves useful. The more powerful and irritant drugs must always be employed with caution, however, and as a rule it is wise to commence with the weaker and milder preparations and gradually work up to the stronger ones. Even after the disease is apparently eradicated, it is usually advisable to employ a non-irritating parasiticide, as an ointment containing ammoniated mercury (2 to 5 per cent), or an aqueous solution of sodium hyposulphite, for a period of several weeks in order to guard against relapses.

Ringworm of the scalp is one of the most rebellious and obstinate of skin affections. The disorder is an extremely infectious one, and, as Corlett has stated, the adoption of prophylactic measures is an important step which should never be overlooked. While the most frequent source of infection is through the common use of combs and brushes, and the interchanging of headgear, the barber shop sometimes serves as a medium of contagion, and even the medical attendant himself, by neglecting the simple rules of surgical cleanliness, may be responsible for the spread of the disorder. In addition to keeping the patient's hair closely clipped or the head shaved, a snugly fitting paper cap, to be changed twice in the twenty-four hours, should be constantly worn. Handy and inexpensive caps can be made by cutting off the tops of ordinary paper bags of proper size.

The successful treatment of ringworm of the scalp is dependent upon the prevention of the development of new foci, and the eradication of the lesions already existing. In view of the first, it is very essential that the scalp be maintained in as aseptic a condition as possible, and for this reason the head should be frequently washed with soap and water and a reliable antiseptic, as bichloride of mercury (0.1 per cent) in alcohol, or better, an ointment containing ammoniated mercury (10 per cent), applied once daily to the entire region. Inasmuch as local antiseptics cannot reach the bottom of the follicles so long as the hairs are in place, it is essential that the hairs in the diseased areas be removed. This is best accomplished by means of the x-rays. If this agent is not available, a chemical depila-

tory, as barium sulphide, which is mixed with equal parts of zinc oxide and starch, moistened, and applied to the area for a few minutes, may be employed, or epilation with forceps may be practiced The marginal hairs as well as those in the center should be removed. In very young children, frequent shaving of the affected areas often proves sufficient. Of the various parasiticides that have been suggested, iodine, ammoniated mercury, chrysarobin, sulphur, tar, betanaphthol, and resorcin probably constitute the most valuable group. In the employment of local antiseptics, the secret of success generally lies in the thorough application of the agent In babies and very young children mild applications, as ammoniated mercury or sulphur (5 per cent), in benzoinated lard, are to be advised. In older children, and particularly in long standing cases of the disease, recourse must occasionally be had to the more powerful irritants and parasiticides, as croton oil, and saturated solution of chrysarobin in chloroform. Needless to state, drugs of this character should be employed cautiously. In the earlier stages of the disease when the fungi are still near the surface, Harrison's iodine-mercury combination often proves serviceable. The method consists in applying tincture of iodine to the part, immediately followed by a 1 per cent aqueous solution of bichloride of mercury. Salinger speaks highly of tincture of iodine, to be painted on once or twice daily until the part becomes crusted. He also recommends an ointment containing salicylic acid, 8 parts, betanaphthol, 5 parts, resorcin, 4 parts, and lanolin 100 parts. Jackson has suggested the use of a mixture of goose grease and iodine crystals (12 per cent), to be applied twice daily until a reaction is produced, then less frequently. The remedy is a valuable and efficient one. Aldersmith recommends constantly soaking the parts in a saturated solution of boric acid in equal parts of spirit of ether. Ionization is mentioned only to be condemned. In the hands of many experienced dermatologists it has proved worthless.

The x-ray treatment of ringworm of the scalp is based upon the power of this agent to cause depilation. The out-falling hairs carry with them many spores, and the location of those remaining is such that they can readily be reached and destroyed by means of parasiticides before the hair regrows at the end of about three months. The removal of the diseased hairs can be brought about through the employment of either the divided dose or the massive dose (intensive method. The latter, which was first advocated by Sabouraud and

Noiré, in 1909, and perfected by Holzknecht, Kienböck, Adamson, Coolidge, MacLeod, MacKee, and others, is by far the more accurate and scientific, but it should be undertaken only by a trained radiotherapeutist. The dosage is measured both as to quantity and quality. It is not always necessary to depilate the entire scalp, but when the diseased hairs fall out care must be exercised to prevent the healthy ones from becoming infected.

Fig. 845.—The x-ray treatment of ringworm of the scalp. Showing tube stand and shield fitted with wooden pegs for the purpose of holding the head steady. (Courtesy of Dr. George M. MacKee.)

As described by MacKee and Remer, the following technic is the one in use in Fordyce's clinic: In carrying out the intensive plan of treatment, the hair is closely clipped, and the surface of the scalp divided into four equal sized triangular-shaped areas, as shown in Figs. 846, 847, and 848. A mark is made (with a skin pencil) about 2 inches inside of the hair line above the forehead in the median line (Figs. 846 and 848). This we will designate point *A*. A steel tape meas-

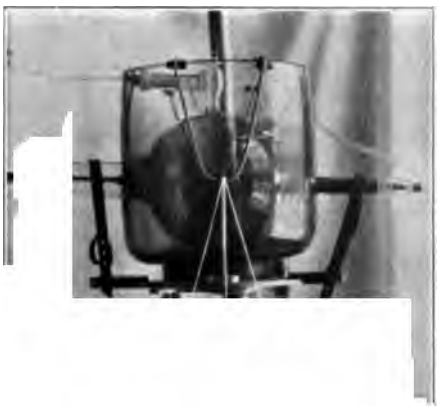

Fig. 846.—The x-ray treatment of ringworm of the scalp. Showing Point *A*. (Courtesy of Dr. George M. MacKee.)

Fig. 847.—Showing Point *C*. (Courtesy Dr. George M. MacKee.)

Fig. 848.—Showing Points *A, B, C and D*. Also the lines drawn between the various points and how the angles of incidence are obtained. Point *E* is not shown in picture, but is on opposite side of skull from Point *D*. (Courtesy of Dr. George M. MacKee.)

ure is then placed with zero on point *A* and stretched along the median line over the vertex to the neck. At 10 inches another mark is made—point *B* (Fig. 848). This will usually be about 2 inches inside of the hair line on the neck, but will vary somewhat in accordance with the size of the head. Points *A* and *B* should be adjusted so that they are

Fig. 849.—Ringworm of the scalp after depilation with the x-rays. (Courtesy of Dr. George M. MacKee.)

about the same distance inside of the anterior and posterior hair lines. As a matter of fact, *A* and *B*, in some instances, may fall exactly at the hair line, but this makes no difference so long as the distance between them is exactly half way between points *A* and *B* (Figs. 847 and 848). On every skull there is a flat surface just anterior to the occiput and point *C* will fall from 1 to 1½ inches in front of the center of this

area. As a matter of fact it is a good idea to insist upon point *C* being exactly at this location and adjust *A* and *B* so that they will be just 5 inches anterior and posterior to *C*. Point *D* is then located just above and in front of the right external auditory meatus (Fig. 848). The exact position of this spot is found by measuring 5 inches from *A*, *B*, and *C*. Point *E* represents the same location on the left side. It is essential that each point be exactly 5 inches from every other point, with the exception, obviously, of the distance between points *A* and *B*, which should be 10 inches.

The next step is to draw lines between the various points (Figs. 846, 847 and 848). This will divide the scalp into four triangular-shaped, equal areas. The reason for this will be made clear later.

Next, each point—*A*, *B*, *C*, *D*, and *E*—receives an epilating dose of x-ray in the following manner:

For point *A* the child lies on its back on a table. The entire face below the hair line is protected by a lead mask. The tube is placed with the anode exactly over and 6½ inches from point *A* (Fig. 846). It will be seen that the vertical rays will strike point *A*, while half of the oblique rays will fall upon the anterior portion of the scalp, and the remaining half will strike the protecting shield on the face and be wasted (Fig. 848). The measuring pastille is now placed on point *A* and the epilating dose administered.

Points *B*, *C*, *D*, and *E* are now to receive the epilating dose in the same manner with the following exceptions: For point *C* the patient may recline on a table or sit upright on a chair. No protection is required. Here the oblique rays spread over the anterior, posterior, and lateral portions of the scalp (Figs. 846 and 848). For point *B*, the child may lie on his side on the table or sit in a chair with his forehead resting on the table. It is necessary to protect the neck, shoulders, and back. Here half of the oblique rays will reach the posterior portion of the scalp while the other half will spread over the shoulders and back (Figs. 846 and 847). For points *D* and *E* the patient lies on his side on a table and the ears, face, and neck are protected (Figs. 847 and 848). Here, as in points *A* and *B*, half of the oblique rays are lost.

It is of the utmost importance that each treatment be at right angles to every other treatment. For instance, an imaginary line drawn from the anode to point *A* will be at right angles to lines extending from the anode to points *C*, *D*, and *E*. Figs. 846, 847 and 848 will explain these angles better than words and, also, they will demonstrate that the lines drawn on the scalp between the five points aid one in quickly determining the correct angle.

Freeman, of St. Paul, has found deep freezing with carbon dioxide snow a valuable measure in kerion.

In the *treatment of tinea trichophytina barbae,* cleanliness is fully as important a factor as in combating ringworm of the scalp. The beard should be kept short, and the diseased hairs removed, either by means of the x-rays or by frequent epilation with forceps. Ointments containing ammoniated mercury (5 per cent), or oleate of mercury (10 per cent), may be employed as in tinea capitis, or the face may be bathed two or three times during the day with a solution of sodium hyposulphite, and an ointment containing sulphur (10 per cent) freely applied at night. The patient should be informed of the danger of communicating the disease to others, particularly through the media of razors and similar articles. Beck, of Clarkfield, Minnesota, recommends thorough injection of the nodules with tincture of iodine, after having first anesthetized the area with novocaine.

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THRUSH.

Synonym.—Sprue.

Definition.—A parasitic form of stomatitis, probably due to the saccharomyces albicans, characterized by the appearance on the mucous membranes and sometimes on the skin of adherent, whitish flakes and patches.

Symptoms.—Thrush is a disease of infancy, although adults, par-

ticularly debilitated invalids who can no longer cleanse the mouth, occasionally are attacked. The lateral margin of the tongue and the inner surface of the cheek are the sites of predilection. The le-

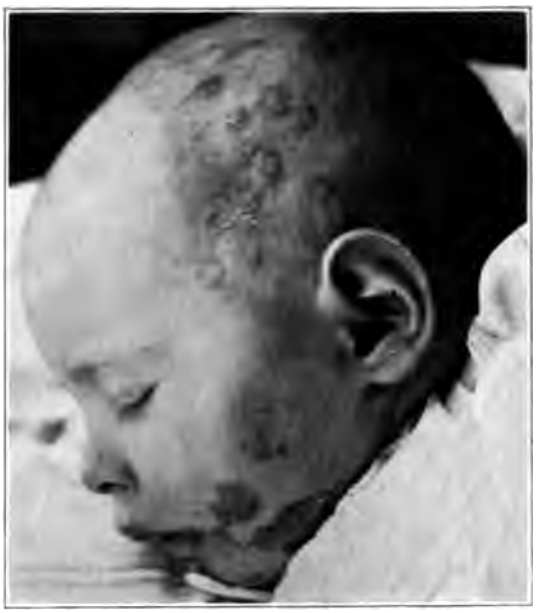

Fig. 850.—Cutaneous thrush. Case referred to in text. (Courtesy of Dr. Jay F. Schamberg.)

Fig. 851.—Cutaneous thrush, case referred to in text. (Courtesy of Dr. Jay F. Schamberg.)

sions resemble deposits of coagulated milk, but are adherent, and when forcibly removed give rise to bleeding points on the surface of

the affected mucosa. In rare instances the integument may be attacked, as in the unique case recently reported by Schamberg. In cases involving the pharynx the disease may be confused with diphtheria, but a microscopic examination of the deposit will at once reveal its true nature.

Etiology and Pathology.—The disorder is due to infection with a fungus, very probably the saccharomyces albicans. The spores of the parasite are of very common occurrence. Infection often occurs through the medium of a contaminated, artificial nipple. Children suffering from malnutrition, marasmus, or deformities of the mouth, as hare-lip, are especially susceptible to the malady. Histologically, the spores lie on and between the epithelial cells, and according to Wagner and Heubner they sometimes invade the blood vessels, and may be carried to distant parts.

Prognosis and Treatment.—The malady seldom endangers life, and as a rule responds promptly to appropriate treatment. Cleanliness is the most important prophylactic measure. Holt recommends the frequent use of a mild, non-irritating, alkaline mouth wash, as an aqueous solution of borax or sodium bicarbonate (10 per cent), and the application to the affected mucosa of a saturated aqueous solution of boric acid four times daily.

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FAVUS.

Synonyms.—Tinea favosa; Dermatomycosis favosa; Honeycomb ringworm.

Definition.—An infectious disease of the skin, due to a vegetable parasite, the achorion schoenleinii, and characterized by the occurrence on the affected areas of pinhead- to pea-sized, saucer-shaped, yellowish crusts or scutula.

Symptoms.—The disease may involve the hair, the nails, or the glabrous skin. The scalp is the most frequent site of the affection. The lesions commence as minute, whitish, scaly patches. In the course of a few weeks, the cups have assumed definite shape, and are millet- to- linseed-sized, sulphur-colored discs, each of which is usually perforated by a hair. The yellowish mass gradually increases in size until, at the end of another fortnight, it has become a lentil-sized, saucer-shaped scutulum (favus urceolaris), slightly ele-

vated and fringe-like at the edge, but tightly fixed to the underlying epidermis in the center. When the crust is forcibly detached, there remains a corresponding depression, the surface of which is covered with serous, or blood-stained fluid.

If untreated, the favus scutulum tends to spread peripherally, and

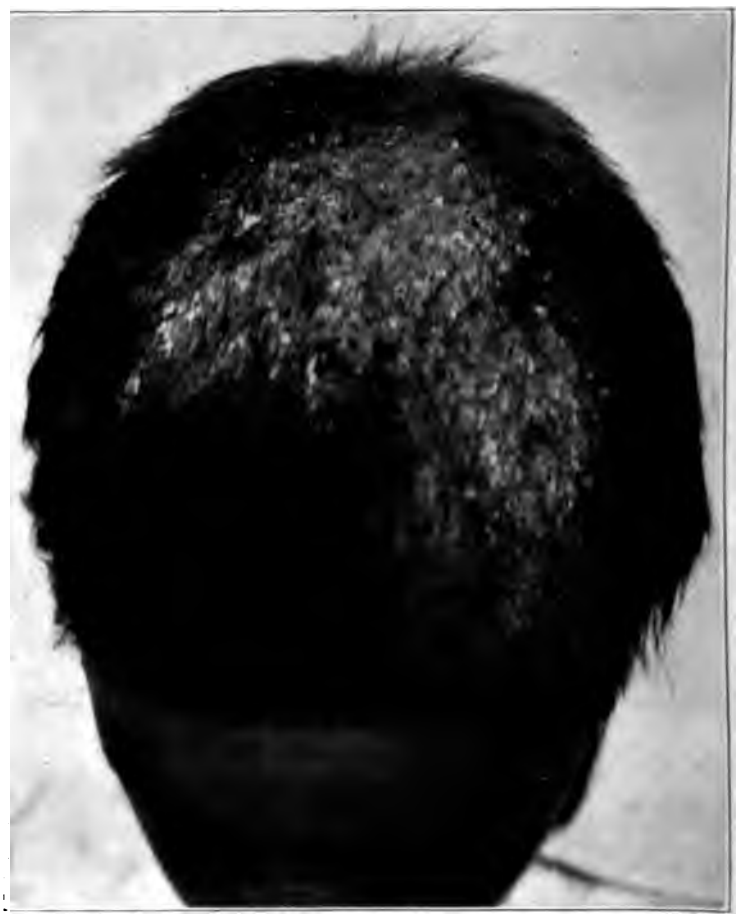

Fig. 852.—Favus of the scalp. (Courtesy of Dr. J. E. Lane.)

neighboring lesions may coalesce, forming thick, mortar-like masses. Individual crusts, if undisturbed, may slowly increase in size until they attain a diameter of 1 cm. or more, the central, oldest portion becoming, meantime, of a whitish or pearly color, and the peripheral, or younger, portion remaining yellowish, but exhibiting furrows in

Fig. 853.—Favus of the scalp, showing typical crusting. (Courtesy of Dr. George M. MacKee.)

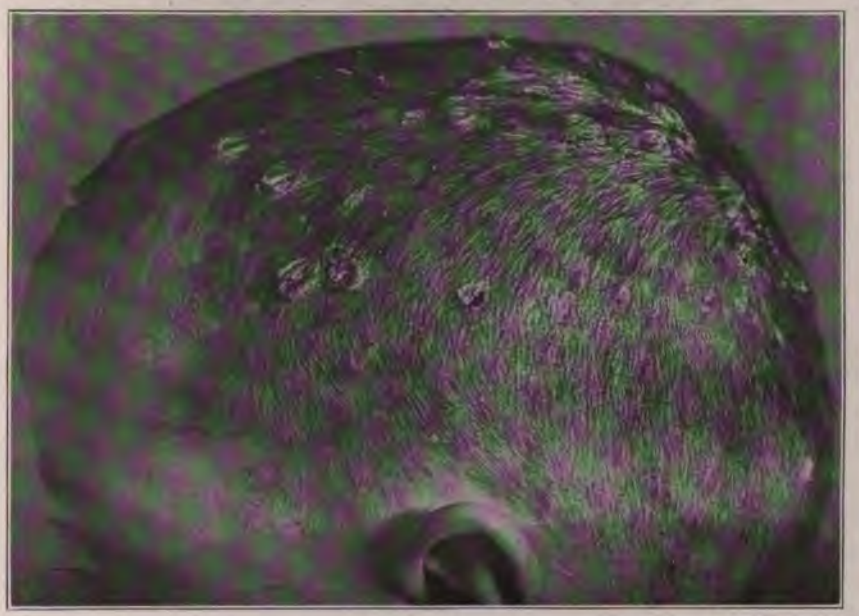

Fig. 854.—Favus of scalp, showing typical scutula. (Courtesy of Dr. Geo. M. MacKee.)

concentric rings (hence the comparison to "honeycomb," or to "crabs' eyes"). In some instances after the scutula have attained a certain size, they cease to spread peripherally, and tend to grow freely from the surface, forming heaped-up, irregular, crusted masses. The scutula possess a peculiar, mouse-nest-like odor which is characteristic of the disease. Over the affected areas many of the hairs become dull, dry, lusterless, and brittle, and are easily extracted.

Fig. 855.—Favus of the glabrous skin. (Courtesy of the U. S. Public Health Service, Immigrant Hospital, New York City.)

In long standing cases the follicles may become entirely obliterated as a result of pressure atrophy. The depressions in the vicinity of the follicular orifices superficially resemble the scars of acne varioliformis. The progress of the disease is extremely tedious, extending over a period of many years. In severe cases of the disorder, the destruction may be so great that all that may be left of the scalp, in

smaller or larger areas, is a thin, cigarette-paper-like covering over the skull, every other vestige is wiped out.

In the glabrous regions, the disease is more acute, and may ap-

Fig. 856.—Favus of nails. (Courtesy of U. S. Public Health Service, Immigrant Hospital, New York City.)

Fig. 857.—Favus of nails. (Courtesy of the U. S. Public Health Service, Immigrant Hospital, New York City.)

pear as reddish, scaly, discoid patches, which often extend in a concentric manner, not unlike the lesions of ringworm. Several or more typical scutula are commonly present, however. Favus of the

body is usually, but not invariably, accompanied by favus of the scalp. On the smooth surfaces circumscribed atrophy is a less prominent feature, and the minute, white, cicatricial depressions become

Fig. 858.—Organism of favus from nails. (Courtesy of the U. S. Public Health Service, Immigrant Hospital, New York City.)

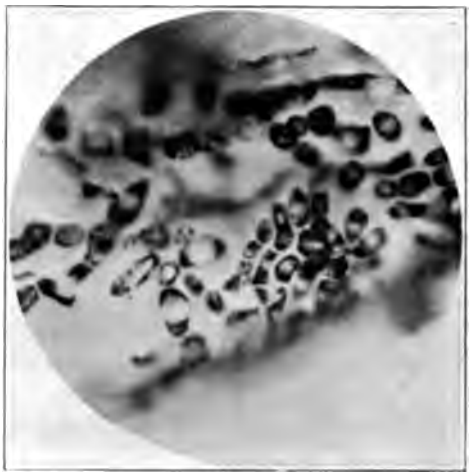

Fig. 859.—Achorion of Schoenlein. Magnification 1000 diameters. (Courtesy of Dr. B. Barker Beeson.)

more or less superficial and indistinguishable in the course of time.

Etiology and Pathology.—The affection is due to a vegetable fungus, the achorion schoenleinii, which was discovered by Schoenlein

in 1839. Both sexes are affected, and no age is exempt, although children are attacked much more frequently than adults. The disease is only moderately infectious, and as a rule spreads as a result of direct contact. A few instances have been reported in which the malady apparently was contracted from handling infected animals (rats, cats, mice, cattle, and horses). It is probable that some of these cases are due to the achorion Quinckeanum (MacLeod). Certain individuals are more susceptible than others to the malady, and lowered states of vitality also possibly predispose to infection. The disease is a not uncommon one in Central, Southern, and Eastern Europe, and in Scotland. Aside from the imported cases, it is exceedingly rare in the United States.

The mycelia are long, narrow, ribbon- or tube-like, branching filaments, which may be straight, curved, or bent. The spores vary very much in size and shape, but usually are large (0.22 mm. to 0.005 mm. in diameter), and rounded or oval in shape. The mycelia and spores are readily recognized in potassium hydrate solution (10 per cent), or they may be stained in the same manner as tinea trichophytina (q.v.).

Histologically, the fungus occurs in the scutula and the hair shafts, and on the surface of the neighboring skin. Hebra and Kaposi state that the favus crusts are interpolated between the superficial and deeper layers of the epidermis and the hair follicle, as in a capsule, the superficial epidermic plate being intimately connected with the mass of the favus, and joining, peripherally, the epidermis of the surrounding parts. The concave surface of the capsule is composed of the compressed deep layers of the epidermis corresponding to the convex under surface of the favus mass. Within the hair shafts the fungus occurs as mycelial threads, which lie parallel with the long axis of the filament, and terminate near the root in a fringe. Robinson states that the parasite penetrates between the cellular layers of the root-sheath, and multiplies in the cortical substances of the hair. Permanent hair loss is due to the mechanical pressure of the growth upon the papilla as well as to direct destruction of the invaded shafts.

Diagnosis.—As a rule the pathognomonic scutula are present. Should they be absent, the characteristic atrophic scarring in the vicinity of the follicular orifices, the presence of diseased and broken hairs, and the peculiar, mouse-nest-like odor, are extremely suggestive. In all doubtful cases a microscopic examination should be made.

The affection is to be differentiated from ringworm, lupus erythematosus, seborrheic dermatitis, and psoriasis.

Prognosis.—The disease tends to undergo spontaneous cure in the course of years. When located on the scalp the malady is particularly obstinate and resistant to treatment. Favus of the non-hairy surfaces is more amenable, especially if promptly and intelligently treated.

Treatment.—The treatment of favus of the scalp is essentially that of tinea trichophytina capitis. The x-rays constitute the most reliable and efficient remedy that we possess, as the reports of Pusey, MacKee, Ormsby, Howard Fox, and others show. The parasiticides commonly employed are those enumerated under the treatment of ringworm of the scalp.

In favus of the non-hairy surfaces, recourse may be had to ointments containing sulphur (10 to 20 per cent), oleate of mercury (10 to 15 per cent), ammoniated mercury (5 to 10 per cent), or chrysarobin (5 to 10 per cent). Tincture of iodine alone often proves effective. In view of the promising results attained by Strickler, Kolmer and others with vaccines in the treatment of ringworm, it is very probable that this method might also prove helpful in combating favus.

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TINEA IMBRICATA.

Synonyms.—Burmese ringworm; Tokelau ringworm; Bowditch Island ringworm; Malabar itch.

Definition.—A disease of warm, moist climates, due to a vegetable fungus, probably of the genus *Endodermophyton* (Castellani), and characterized by the occurrence of scaly patches, which often assume a circinate or concentric arrangement.

The malady was described first in 1789 by Dampier, although we are indebted to Fox, a surgeon with the Wilkes' Expedition, for the earliest American account of the disease. In recent years it has been carefully studied by Manson, Nieuwenhuis, Henggeler, Castellani, and others.

Symptoms.—The eruption begins as one or several minute reddish points, which soon assume a papular aspect, and are accompanied by itching of variable degree. The affected areas gradually increase

Fig. 860.—Tinea imbricata. (Courtesy of Dr. Isadore Dyer.)

Fig. 861.—Tinea imbricata. (Courtesy of Dr. Oscar Henggeler.)

in size until, at the end of several weeks, each measures 1 cm. or more in diameter. The central epidermal covering then becomes cracked or broken, and the outer layers peel off, giving rise to rough-

ly circular patches, the margins of which are formed by upcurled lamellae, with their free edges directed toward the centers of the ex foliated areas, and their attached portions more or less pigmented As soon as new corneous material develops in the central areas, it is again attacked, and the above described process is repeated, until at the end of a few months the integument presents a peculiar, mot tled and imbricated appearance, not unlike "the rings of light and dark on the surface of watered silk." As a result of the coalescence of two or more of the circinate patches, concentric and gyrate figures may be formed. Occasionally the eruption becomes generalized, and the ring-like configuration is entirely lost. The ensuing clinical picture may be mistaken for that of a mild ichthyosis (Henggeler). As a rule the scalp, face, palms, soles, and nails escape. In long

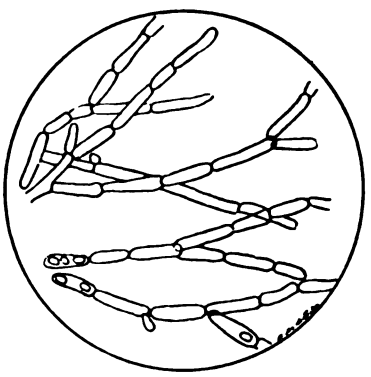

Fig. 862.—Endodermophyton concentricum, hanging drop culture. (After Castellani.)

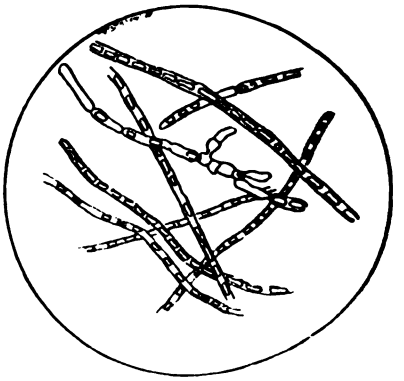

Fig. 863.—Endodermophyton indicum, hanging drop culture. (After Castellani.)

standing cases the scales become thick and horny, and impart to the affected area a peculiar, clay-coated appearance. Aside from the itching, which usually is quite intense, subjective symptoms are absent. The general health is unaffected.

Etiology and Pathology.—The exact nature of the offending parasite is a matter of controversy. The fungus does not penetrate the shafts of the hairs, but occurs in great abundance in the epidermal scales. Nieuwenhuis and Sabouraud believe it to be a large-spored tricophyton. Tribondeau, on the other hand, considers it an aspergillus, and has suggested for it the name "Lepidophyton." The results of the recent investigations of Castellani indicate that the causative organism is a vegetable fungus belonging to the genus

Endodermophyton (Castellani), of which two species probably exist, *E. concentricum* and *E. indicum*. The mycelia branch frequently, and are long and interlacing. No spore-bearing hyphae are present, and reproduction apparently occurs by sprouting. Pleomorphism is much less marked than in the trichophytons, epidermidophytons and achorions.

Histologically, Castellani found that the mycelia invaded the corneous and granular layers of the epidermis, extending downward to a much greater depth than the fungi of either favus or ringworm.

Diagnosis.—The disorder is to be differentiated from ringworm and from ichthyosis. In the former malady the patches are acutely inflamed, the scales are minute and furfuraceous, and the duration of the disease comparatively short. Ichthyosis is usually congenital, or first appears in early childhood. In doubtful cases, a microscopical examination of the scales should be made.

Prognosis and Treatment.—The disorder responds fairly well to appropriate treatment, although relapses are common. Manson recommends linimentum iodi (100 c.c. of which contains 12.5 gms. iodine, with potassium iodide, glycerine, water and alcohol). Castellani speaks highly of a solution of resorcin (12 to 25 per cent) in compound tincture of benzoin. The remedy is applied once or twice daily for several weeks. Hot baths, with sand soap, are taken twice weekly. In the eradication of small patches, formalin sometimes acts well. The usual parasiticides, as sulphur, ammoniated mercury, and salicylic acid, have proved practically useless in combating the affection.

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TINEA VERSICOLOR.

Synonyms.—Pityriasis versicolor; Chromophytosis.

Definition.—A vegetable parasitic disease, due to infection with the *microsporon furfur*, characterized by a yellowish or brownish macular eruption which usually involves the chest and shoulders.

Symptoms.—The majority of the patients are adults, and men are

attacked more frequently than women. The disease begins as one or more minute, rounded macules. The lesions slowly increase in size until they have attained a diameter of 3 cm. or more, although large

Fig. 864.—Tinea versicolor. Close up. (Courtesy of Dr. H. C. Varney.)

plaques may be formed as a result of coalescence. The patches are yellow or brownish-yellow in color, their surface being covered with furfuraceous scales. The scaling is most readily appreciable in individuals possessing dry, harsh skins, although its presence can al-

ways be easily demonstrated by stroking the affected part with the sharp edge of a curette. As a rule the eruption is confined to the chest, shoulders, axillae, and upper abdomen, although occasionally the distribution may be far more extensive. On the other hand, in rare instances the lesions may be confined entirely to certain small areas. Thus Gottheil has reported a case in which only one palm was attacked, and Smith an instance in which the eruption was limited to the soles. The face is seldom involved, although a few chloasma-like lesions may develop in this region in connection with

Fig. 865.—Pityriasis versicolor.

Fig. 866.—Pityriasis versicolor.

the eruption on the chest and neck. Commonly the surface of the patches is smooth and unmarked. Rarely, follicular involvement is a pronounced feature, as in McEwen's case, which superficially resembled an example of lichenoid follicular inflammation. Itching of moderate degree may be present, but as a rule subjective symptoms are almost entirely wanting.

Etiology and Pathology.—The exciting cause is a fungus, the microsporon furfur, which was discovered by Eichstedt in 1846. The mold has been cultivated on artificial media by Spietschka, Matz-

enauer, and others, and Spietschka reproduced the disease from pure cultures. The conidia are rounded or oval in outline, of fairly uniform size, and average about 0.005 mm. in diameter. Ordinarily they are arranged in closely crowded conical heaps. The mycelia are comparatively short, and branch frequently. The mold can be easily

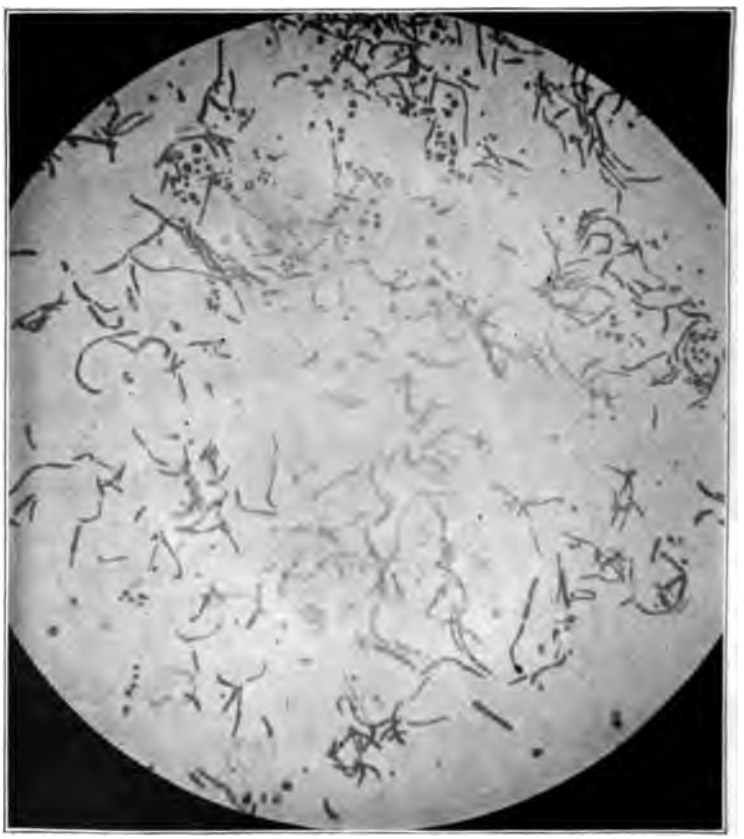

Fig. 867.—Microsporon furfur. Moderate magnification.

detected in scrapings which have been exposed to the action of liquor potassae (10 percent.), and stains readily with methyl-violet and other dyes. Histologically, usually only the corneous layer is involved, but the mycelia may dip down into the prickle layer or even into the ret[illegible] The disease is mildly infectious. Invalids, particularly tubercul[illegible] subjects, are popularly supposed to be prone to attack. This increased vulnerability, if it exists, is probably due to the moist and softened condition of the skin (a result of excessive sweating).

Diagnosis.—The color, distribution, and character of the eruption, together with its tedious course, will usually serve for recognition. In case of doubt, a microscopic examination of the scales will readily settle the question. Chloasma, seborrheic dermatitis, and the hyperpigmented areolae of vitiligo may simulate the disorder. A careful general examination should serve to differentiate the macular syphiloderm, which is of generalized distribution, and is accompanied by mucous patches, lymphnode involvement, and, usually, by the history of a preceding chancre.

Prognosis and Treatment.—The disorder is a harmless one, and responds readily and favorably to appropriate medication. The frequent use of soap and water, followed each time by liberal applications of a saturated aqueous solution of sodium hyposulphite, often proves curative. Crocker recommends the following plan: The skin is thoroughly washed with soap and warm water, and scrubbed with a nail brush. A 5 per cent solution of sodium hyposulphite in water is then rubbed on with a piece of flannel cloth, and this is immediately followed by a 3 per cent solution of tartaric acid in water. By the action of the acid on the sodium salt nascent sulphur and sulphurous acid are produced *in situ*, and only a few applications are required to bring about a cure. Ointments containing sulphur, ammoniated mercury, and similar parasiticides also are valuable, but the majority of patients prefer lotions to greases, and the sodium hyposulphite-tartaric acid combination leaves little to be desired in the way of either cleanliness or effectiveness. The underwear should, of course, be sterilized, preferably by baking, in order to guard against reinoculation. Ormsby and Mitchell highly recommend Whitfield's ointment, which contains 6 per cent salicylic acid and 12 per cent benzoic acid.

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ERYTHRASMA.

Definition.—A vegetable parasitic disease, due to the *microsporon minutissimum*, and characterized by a reddish, yellowish, or brownish, macular eruption which is usually confined to the genitocrural and axillary regions.

The disease was first described by Burchardt, in 1859. The desig-

nation "erythrasma" was suggested by von Bärensprung, three years later.

Symptoms.—The earliest lesions are irregularly outlined, dry, reddish-brown macules, which are usually located in the genitocrural region. Occasionally the patches are orange colored, or of a pale, reddish-yellow hue. The scales are fine, dry, and flour-like. The patches develop and spread slowly, and seldom, if ever, give rise to any subjective symptoms. As a rule the eruption is limited to

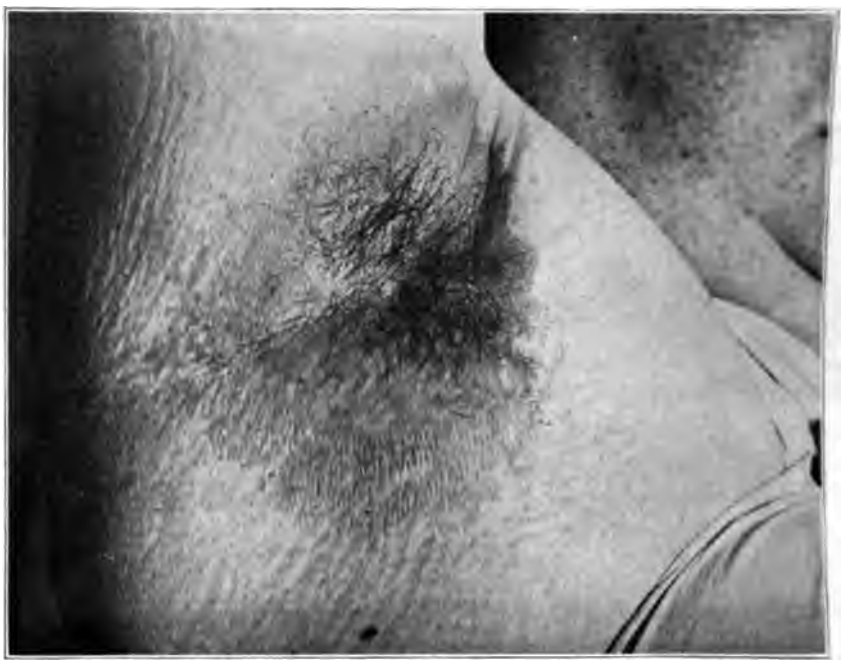

Fig. 868.—Erythrasma. (Courtesy of Dr. Geo. M. MacKee.)

the pubic and axillary regions, although in rare instances, other regions are involved.

Etiology and Pathology.—The parasite which is commonly credited with being the exciting cause is seated in the superficial corneous layers, and is a delicate fungus presenting both hyphae and granules. The threads vary from 0.04 to 0.06 mm. in length, averaging about 0.001 mm. in diameter, and are piled into irregular heaps (Burchardt).

Diagnosis.—The color, size, distribution, number, and course of the patches should serve to distinguish them from the lesions of tinea versicolor. The eruptions of pityriasis rosea and of tinea tri-

chophytina cruris develop rapidly, and both are accompanied by well-marked signs of inflammation. In doubtful cases a few of the scales should be mounted in liquor potassae (10 per cent), and examined microscopically.

Prognosis and Treatment.—The malady is more resistant to medication than tinea versicolor, and relapses and recurrences are common. The same methods of treatment are applicable to both disorders.

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PINTA DISEASE.

Synonyms.—Spotted sickness; Mal del pinta.

Definition.—An infectious parasitic disorder of the skin and mucous membranes, characterized by the occurrence of variously sized, shaped and colored scaly patches.

The term "Pinta" is derived from Spanish "pintar" (to paint). The malady is endemic in certain warm countries, notably tropical America, and has been recognized for more than a century.

Symptoms.—The attack may be ushered in by disturbances of the gastrointestinal tract, but manifestations of this character are usually wanting. The cutaneous lesions are due to the growth of fungi in the superficial layers of the epidermis, and as a rule first appear on one of the exposed surfaces, the face and neck being sites of predilection. The patches are sharply defined, and more or less itchy from the beginning. They vary greatly in hue. At first they are usually pinkish or reddish, but later they may assume a yellowish, brownish, violaceous, or blackish shade. Ultimately, in the course of four or five years, the affected areas become atrophic and white. When the scalp is involved baldness of variable degree results, probably as a result of fibrosis with ensuing atrophy (Castellani and Chalmers). On the glabrous skin the scaling is at first furfuraceous, but later becomes lamellar in character. The integument is dry and harsh, and fissuring and ulceration about the flexures are not uncommon.

The distribution of the eruption is asymmetric, and often fairly general, although as a rule the palms and soles are spared. The mucous membranes of the mouth, prepuce, and vulva occasionally are

involved. In cases of long standing the diseased skin emits a foul, disgusting odor.

Etiology and Pathology.—The disease is mildly infectious, and affects both the Caucasian and negro races. Both sexes, and all ages, except infants, are attacked. The results of the investigations of Florez and others indicate that the affection is due to the action of several fungi, notably the *Aspergillus, Penicillium, Monilia,* and possibly, a trichophyton (Blanchard and Bodin). According to Florez, the red variety of the disease is confined almost exclusively to white people, and the black form to negroes.

Prognosis and Treatment.—There is little tendency to spontaneous cure. The disease responds fairly promptly to parasiticides, however, particularly iodine and the mercurials (as white precipitate and citrine ointments).

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MYRINGOMYCOSIS.

Myringomycosis is a superficial inflammatory disorder of the external auditory meatus and, occasionally, of the canal drum, due to the action of certain fungi, probably the aspergillus niger and the aspergillus glaucus. The parasites form a thick, grayish, blotting-paper-like coating on the surface of the affected skin. When this material is forcibly removed, more or less oozing of serum and blood results. There is itching, stinging, and, if the drum is involved, impairment of hearing.

Prognosis and Treatment.—The malady does not tend to spontaneous cure. As a rule it responds favorably and promptly to mild antiseptics, as sodium hyposulphite (1 per cent) or alcohol (50 per cent).

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MYCETOMA.

Synonyms.—Madura-foot; Podelcoma; Fungus foot of India.

Definition.—A chronic, infectious disorder due to a species of streptothrix, and characterized by swelling of the affected part, with

subsequent disintegration of the subcutaneous structures, and the formation of sinuses which open on the surface of the skin.

The malady is an endemic one, chiefly of certain parts of India, although it is occasionally observed in Turkey, Syria, Mexico, Central America, and the Philippines. Of the cases originating in North America, that of Adami and Fitzpatrick is probably the first that has been recognized. Their patient was a French Canadian, 21 years old, a native of Montreal, who had never been outside of Canada. Parkes' patient had previously resided in India, and in the case described by Kemper and Jamieson the course of the disease was so rapid and the pain so great that, in the absence of corroborative microscopic evidence, a diagnosis of mycetoma could safely be excluded. In the example reported by Hyde and Senn the patient was a dental student, 20 years of age, a native and resident of Iowa. Artwine and Lamb's case occurred in a Mexican laborer, 45 years old, and Pope and Lamb's patient also was a Mexican laborer, aged 27. The fifth, and last, American case that I have been able to find a record of is the one on the study of which Wright largely based his admirable contributions to the subject of mycetoma. The patient was an Italian woman, 26 years of age, on Dr. H. H. A. Beach's service at the Massachusetts General Hospital.

In 1913, I had an opportunity to study and report two cases, one of which originated in Mexico, the other in Texas.

Symptoms.—As a rule, the foot, hand, or knee is the part attacked. The fungus usually gains entrance at the site of an injury, as an incised or punctured wound. In the course of several days or weeks, the part becomes swollen and edematous, and a small, firm nodule develops. The appearance of this lesion is soon followed by that of others, until the affected part frequently presents a purplish, knobby appearance not unlike that seen in actinomycosis. A considerable percentage of the nodules remain firm and solid, but the majority become perforated centrally by slender, tortuous canals which extend far downward into the deeper structures of the part, and give exit to variable amounts of oily, seropurulent fluid containing numbers of variously colored "druses" or "grains."

Clinically, mycetoma may be divided into three varieties, the yellow or ochroid, the black, and the red, so named because of the color of the small masses or granules which are discharged. The ochroid is the commonest type, while the red is extremely rare. In a statistical study of one hundred cases of mycetoma, Bocarro, of the

Hyderabad Medical School, found that 91 per cent of the patients were tillers of the soil, and that the remaining 9 per cent spent the greater portion of their time barefoot in the open air (boatmen, porters, and beggars). Eight of the patients were females, seven being the wives of agriculturists. The disease occurred most frequently between the ages of 21 and 40. Crocker states that a history of previous attack of guinea-worm disease is often present, but

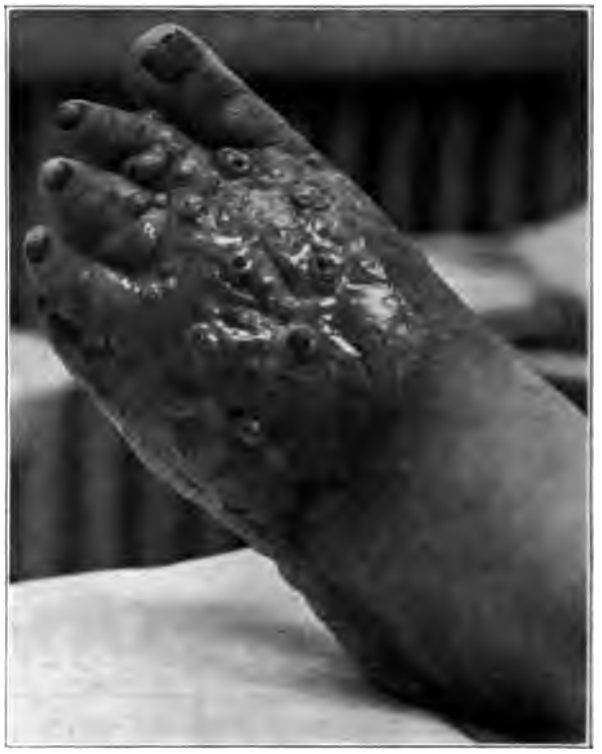

Fig. 869.– Mycetoma. (Courtesy of Dr. John W. Perkins.)

Bocarro found that the causative organism most frequently gained entrance through the wound left by a thorn prick. While the disease usually affected the feet, other exposed parts, especially the hands and the knees, occasionally were attacked.

Bacteriologically, the consensus of opinion would indicate that the yellow and the black, the two varieties that have been most exhaustively studied, are due to different organisms. Jackson has found that the ochroid organisms, when grown in association with

pyogenic cocci, on steamed potato, will sometimes, after a month or two, take on a rose color, or even a red color. It may be that this explains the origin of the much-discussed red growths of the streptothrix isolated and studied by Vincent and, later, by Gémy and Vincent.

Vandyke Carter, to whose masterly monograph we owe much of our knowledge of this disease, believed that the pale particles repre-

Fig. 870.—Mycetoma.

Fig. 871.—Mycetoma, showing sinus openings on sole of foot.

sented an evolutionary stage of the same organism found in the black variety. Kanthack studied three cases of the black form and twelve of the yellow, and concluded that both were due to the same fungus, an actinomyces. Boyce and Surveyor, while acknowledging the similarity of the organism found in these two varieties of mycetoma and in actinomycosis, believe that the two forms differ distinctly in etiology. They examined seven cases of the black type, and found

the particles to consist of a brown pigment-substance, readily removable in Javelle water, and containing a large, branching, septate fungus. No organisms of fructification were observed. In Adami and Fitzpatrick's case, the fungi were identical in general appearance with actinomycetes but the clubs were much larger. Oppenheim, who obtained his material from the Tametsee Dkidjisbhoy Hospital in Bombay, made a comparative histologic and bacteriologic study of the yellow and black varieties. Clinically, and in their main histologic features, he found them very similar, in fact, practically identical. In the yellow form there was apparently a somewhat greater tendency to connective-tissue proliferation, while in the black type abscess formation and liquefaction were more prominent features. Bacteriologically, however, the two conditions were very dissimilar. The organism from the yellow variety he believed belonged to the actinomyces group, while that isolated from the black was more of the nature of an öidium.

Wright found that the granules in the yellow variety were composed of micro-organisms from the streptothrix group, to which the actinomyces is now generally thought to belong, and not to the more highly organized hyphomycetes. He considered it not unlikely that many of the ochroid cases were nothing more nor less than actinomycosis.

Unna, in his work on actinomycosis and its possible relation to Madura-foot disease, found that the causative fungi in the two affections, while resembling each other culturally and morphologically, possessed marked tinctorial differences, the actinomyces, when first fixed by aniline xylol and then decolorized with aniline, staining readily with acid fuchsin, while the adult streptothrix madurae was affected but little, or not at all, by prolonged contact with this dye.

Later Unna and Delbanco again investigated the subject, both from a histologic and bacteriologic standpoint, and finally arrived at conclusions coinciding, in the main, with those which Unna reached in his first research.

MacLeod believes that Vincent's streptothrix is the etiologic agent in the yellow variety of mycetoma, and that this organism is allied to, but differs from, the actinomyces. The black species of Madura-foot he thinks is due to a degenerate form of the same fungus. Stokes concludes that the causative fungus is an actinomyces which differs from the other types in its ability to liquefy casein, and by the rose color of its cultures.

One of the most recent and valuable investigations that has been made regarding the etiology of mycetoma is that of Musgrave and Clegg. Their material was obtained from a typically clinical case of the ochroid variety, of three years' duration in a Philippine woman, 30 years old. With an organism which they isolated, and to which they gave the name *Streptothrix freeri,* they performed inoculation experiments on forty monkeys, guinea-pigs, rabbits, dogs and pigeons. In three instances, typical examples of Madura-foot developed in monkeys after the injection of cultures of the organism into the tissues of the foot. On the other hand, in no instance was a progressive disease produced by inoculation into other parts of the body.

Variations in the color of the granules were occasionally noted, and in one instance, in which the subject was a monkey (Cynomolgus philippinensis Geoff), a fair number of small, black granules were produced in the tissues following a subcutaneous inoculation of the organisms.

The statement, which has often been repeated, that the ochroid variety of mycetoma is actinomycosis is not supported by the weight of evidence in the literature, and is positively disproved by the results of Musgrave and Clegg's work.

As these investigators conclude, it is probable that all types of mycetoma are due to streptothrix infection, but whether all forms are caused by an infection with the same organism, or whether more than one species plays a part in the disease cannot at this time be stated positively.

Chalmers and Archibald would separate the cases formerly considered as examples of mycetoma into three groups: true mycetoma, with typical sinus formation, and the discharge of large and characteristic grains; paramycetoma, grains small or entirely absent; and pseudomycetoma, sarcomatous and epitheliomatous-like growths which more or less resemble mycetoma in external characteristics, but in the discharge of which no grains are to be found.

Diagnosis.—The localization, character, and history of the lesions, and the presence of a fuchsin staining ray fungus should serve for recognition. My friend, Dr. E. L. Stewart, succeeded in securing excellent cultures of the organism by first repeatedly washing the granular masses in sterile water, and then planting them on glucose-serum-agar (+ 1.5).

Prognosis.—The disorder is an extremely chronic one, commonly

extending over a period of many years. It does not involve the in ternal organs, and seldom if ever is the direct cause of death, but i is exceedingly resistant to treatment, and does not tend to spontane ous cure.

Treatment.—Potassium iodide, copper sulphate, and similar in ternal remedies may be tried. Temporary improvement sometime follows the employment of the x-rays, but as a rule radical surgi cal intervention offers the only hope of a permanent cure.

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ACTINOMYCOSIS.

Synonym.—Lumpy jaw.

Definition.—Actinomycosis is a chronic infectious disease due t the ray fungus.

Symptoms.—In the skin the parasite gives rise to sluggish, nodu lar, infiltrated lesions which commonly tend to break down in th center, and form chronic subcutaneous abscesses. These generall communicate with the surface by means of several or more narrow fistulous tracts. The jaw, face, and neck are the most frequent site of the disease, probably owing to the fact that carious teeth and th tonsillar crypts supply ready ports of entry for the fungus.

The cutaneous form of the disease begins as one or more firm, red dish or purplish, infiltrated, subcutaneous nodules. The lesions de velop slowly, and in the course of several weeks or months tend t soften and become fluctuant. The overlying epidermis sloughs awa at one or several points, giving exit to variable amounts of purulen matter with which are intermixed minute masses of fungi. As a rule the involved areas are circumscribed, and of only moderate size Occasionally, as in Pringle's case, they may be extensive, and in volve several regions of the body. While infection usually occurs

through the teeth or tonsils, several instances of this type have developed following trauma. The malady may involve only the skin and subcutaneous structures, or it may be systemic, or both systemic and cutaneous. Varney's case, which occurred in a Swedish laborer, was of the mixed variety.

Etiology and Pathology.—The disease is infectious, but not highly so, and communication from one individual to another is comparatively rare. Animals, particularly cattle, are a frequent source of contagion, and infection occasionally results from handling or chew-

Fig. 872.—Actinomycosis. (Courtesy of Dr. H. C. Varney.)

ing contaminated grain, as in Zeisler's and Varney's cases. Apparently some individuals are more susceptible than others, and "as in other infections, the varying numbers and vitality of the seed and the fertility of the soil determine the result in large measure" (Lord).

The actinomyces is a ball-shaped growth, consisting of a central interwoven network, with radiating, bulbous mycelia. It is best stained by Gram's or by the Ziehl-Gabbett method. Several varieties of the fungus are recognized. Stokes concludes that the various forms of pathogenic actinomycetes can be classified at present as seven

species, which produce suppuration or necrotic pseudotubercles in man and various of the lower animals.

Diagnosis.—The localization, character, and history of the lesions together with the presence of the yellowish or yellowish-gray granu

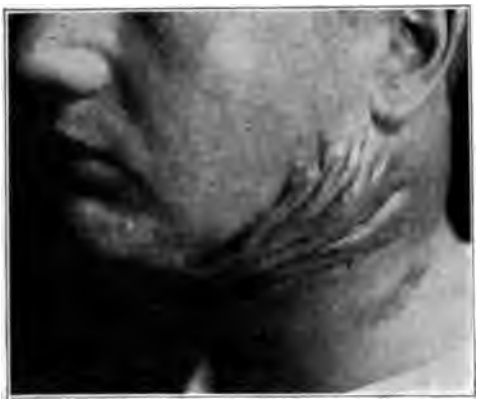

Fig. 873.- Actinomycosis, showing tynical involvement of skin in parotid region. (Courtesy of Dr. Jabez N. Jackson.)

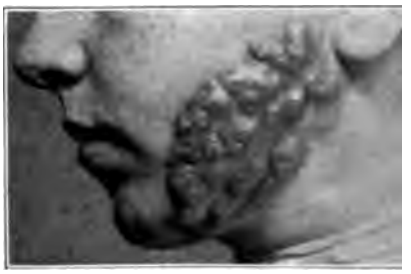

Fig. 874.—Actinomycosis cutis. (Courtes of Dr. T. W. Allworthy.)

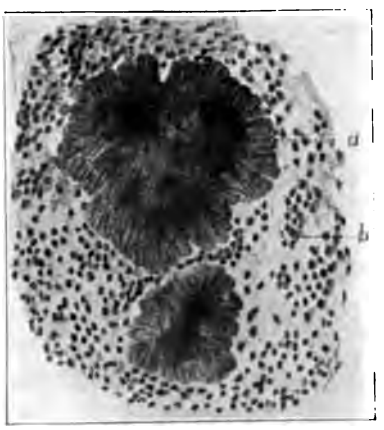

Fig. 875.- Actinomycosis hominis (X 6). (Courtesy of Dr. Arthur E. Hertzler.)

lar masses of fungi in the discharge, should serve to differentiate the malady from syphilis, tuberculosis, sarcoma, and carcinoma. The possible relationship of the affection to mycetoma is discussed under that disease.

Prognosis.—The majority of the localized cases recover. Practical-

ly all of the systemic cases die. The possibility of systemic involvement should always be borne in mind.

Treatment.—Internally, the iodides constitute the most reliable remedy, although Zeisler found copper sulphate, as originally recommended by Bevan, helpful. Locally, curettage, cauterization, the application of iodine and similar antiseptics, or the x-rays may be employed. Of these various measures, Röntgen therapy is by far the most valuable. Any accompanying pyogenic infection may be combated by appropriate vaccines.

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BLASTOMYCOSIS.

Synonyms.—Saccharomyces hominis; Blastomycetic dermatitis.

Definition.—A chronic infectious disorder, due to a fungus, the blastomyces, which commonly attacks the skin, giving rise to reddish or purplish, moist, papillomatous lesions. Frequently, one or more of the internal organs may become involved.

We owe much of our knowledge of the symptomatology of this affection to the studies of Gilchrist, Hyde, F. H. Montgomery, Ormsby, Ricketts, and Hektoen in this country, and Buschke in Germany.

Symptoms.—The disease begins, as a rule, on some exposed surface, the hands, face, and ears being favorite sites. The earliest recognizable lesion is a pinhead- to pea-sized papule or papulopustule, which gradually enlarges, either by peripheral extension or by the development of new foci, until it has attained a diameter of from 1. to 20. cm. Crusting is present, almost from the beginning. When the rough, scaly covering is detached, the underlying lesion is found to consist of reddish or purplish, irregular, papillomatous tumors, bathed in seropurulent fluid. Usually the subcutaneous cavities are of rather minute size, but ocasionally sluggish, carbunculoid abscesses develop in the deeper structures. Ordinarily, the patches tend to extend peripherally, and heal in the center, with the formation of whit-

ish, atrophic scars, not unlike those of lupus vulgaris. In the majority of instances, the disease involves only the skin, where it is limited to one or more circumscribed areas, but occasionally, as in the cases reported by F. H. Montgomery, Montgomery and Ormsby, Walker and Montgomery, Eisendrath and Ormsby, Shields, Fontaine, Haase and Mitchell, Swift and Bull and many others, the malady be-

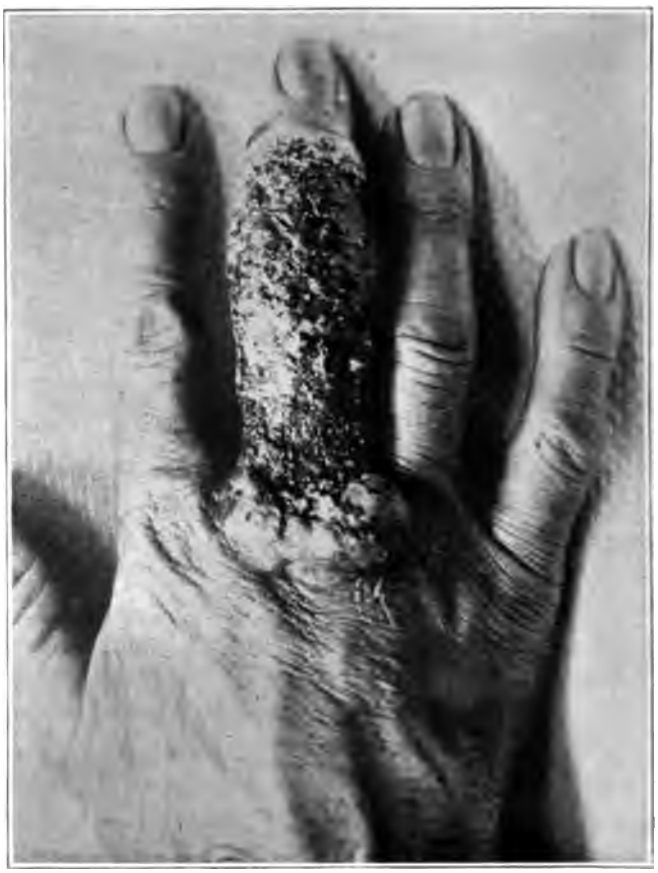

Fig. 870. Blastomycosis of hand. (Courtesy of Dr. Otto Leslie Castle.)

comes systemic, and death usually ensues in the course of a few weeks or months. The localized forms may give rise to some itching and burning, and, rarely, to pain of variable degree, but as a rule the subjective symptoms are comparatively trifling.

Etiology and Pathology.—The disease is due to infection with a fungus, the blastomyces, which usually gains entrance at the site of

a wound. For this reason, adult males are most frequently attacked, although Kessler has reported a well-marked case of the disease in an infant of 5 months. The organisms are spheric in shape, encapsulated, and vary from 7 to 20 microns in diameter. Reproduction probably occurs by gemmation. When suspended in a 10 per cent potassium hydrate solution the fungi appear as double-contoured, refractile bodies, many of which contain granules, or shining, spore-like bodies. A few are vacuolated. The parasite is present in varying numbers in the cutaneous abscesses, and the disease has been reproduced

Fig. 877.—Blastomycosis. (Courtesy of Dr. Grover W. Wende.)

experimentally in animals by Gilchrist, Hektoen, and F. H. Montgomery and Ricketts. Beer-wort and glycerine and glucose agars are the best media.

The following description of the histopathology of a lesion is taken from F. H. Montgomery's admirable article on the subject. The striking and characteristic changes occur in the rete, which is the seat of extensive hyperplasia, sending down processes deep into the corium. These processes are exceedingly irregular in size and shape, and send out branches in all directions. They contain the miliary abscesses

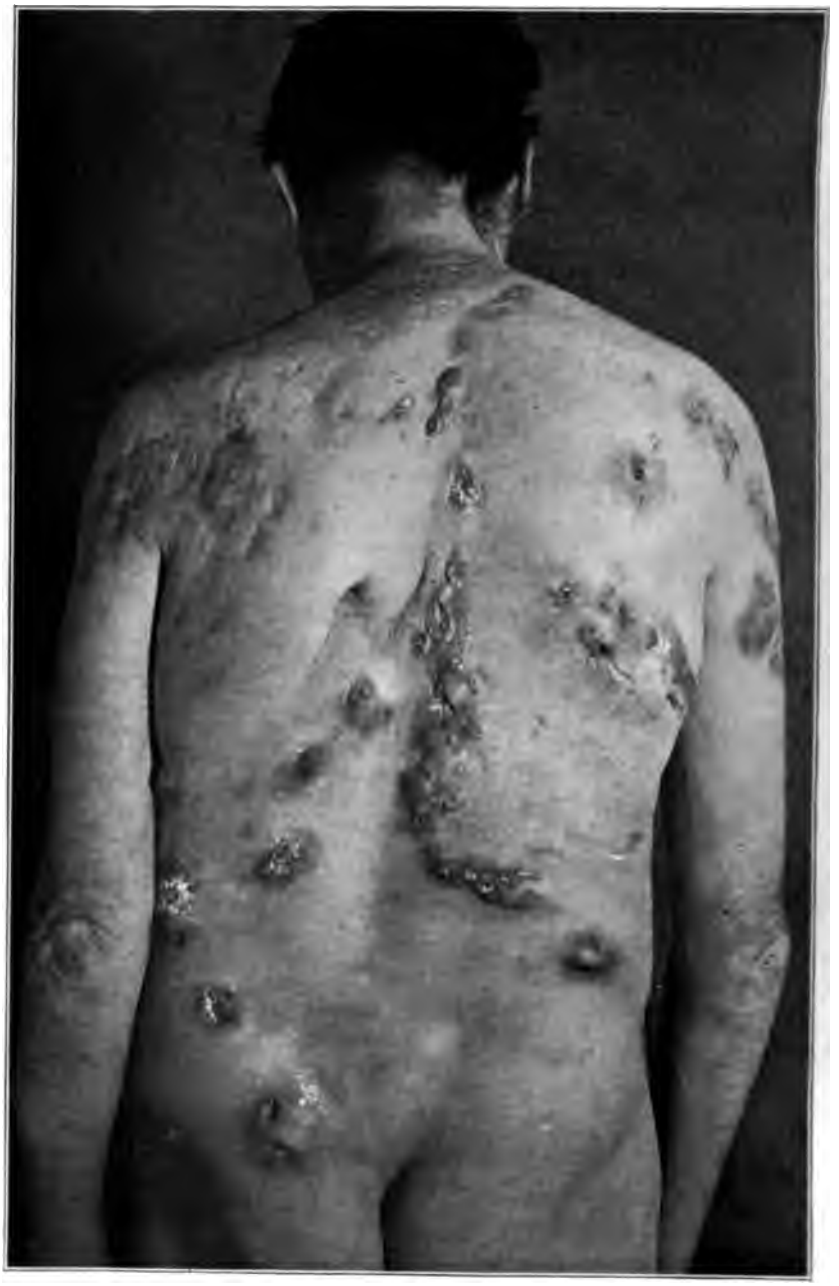

Fig. 878.- Blastomycosis. A very extensive case. (Courtesy of Dr. Geo. M. MacKee.)

which are peculiar to this disorder. These abscesses vary in size from a group of half a dozen leucocytes to those which are large enough to be recognized by the unaided eye. They contain leucocytes,

Fig. 879.—Blastomycosis in an infant. (Courtesy of Dr. J. B. Kessler.)

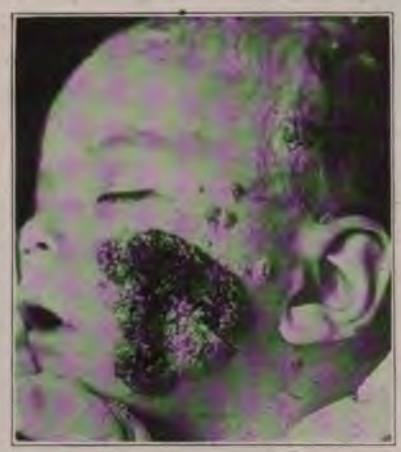

Fig. 880.—Blastomycosis cutis in an infant. (Courtesy of Dr. J. B. Kessler.)

Fig. 881.—Blastomycosis of lower eyelid. (Courtesy of Dr. J. B. Kessler.)

Fig. 882.—Blastomycosis cutis. (Courtesy of Dr. John W. Perkins.)

nuclear fragments, detached epithelial cells, epithelial detritus, red blood corpuscles, blastomycetes, and, frequently, giant cells. The rete is edematous, and infiltrated with polynuclear leucocytes. The basal layer of columnar cells is always well preserved. The corium is the

seat of subacute, chronic and occasionally acute inflammatory changes, and miliary abscesses occur here also. The vessels frequently exhibit hyperplastic changes. Mast cells and giant cells are fairly numerous. The causative organisms occur both in the abscesses and in the giant cells. Ormsby found Unna's methylene blue and orange tannin combination the best dye for staining the organisms in sections.

Diagnosis.—The disease is to be differentiated from tuberculosis of the skin, sporotrichosis, the vegetating syphiloderm, and eruptions due to drugs. The resemblance to tuberculosis verrucosa cutis some-

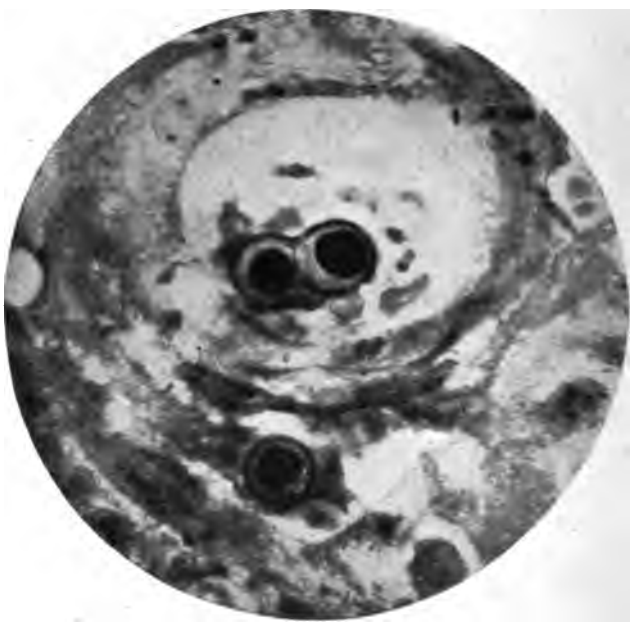

Fig. 883.—Blastomycosis cutis. A pair of organisms in an incipient intraepithelial abscess. Also a single mature form between epithelial cells. High magnification. (Ricketts.)

times is so close as to require cultural methods of differentiation. In addition to the bacteriological and histological differences, the tuberculous lesions usually develop more slowly, and are more limited in extent than those due to yeast fungi. Lupus vulgaris usually begins in childhood, and is relatively slow in its course. The typical "apple-butter nodules" are commonly present, and healing is followed by the development of firm, cord-like cicatrices. In sporotrichosis, the lesions are generally subcutaneous abscesses, and involve the epidermis only secondarily, if at all. The vegetating syphiloderm

usually occurs on the scalp, or in the vicinity of mucous membranes, and is accompanied by other manifestations of lues. Bromide and iodide eruptions may simulate blastomycosis, but the wide distribution of the lesions, together with their history, should prevent confusion. In doubtful cases, resort may be had to a microscopic examination of the seropurulent discharge, or to a biopsy.

Prognosis.—The majority of the localized cases do not endanger life, and respond fairly promptly to appropriate treatment. More

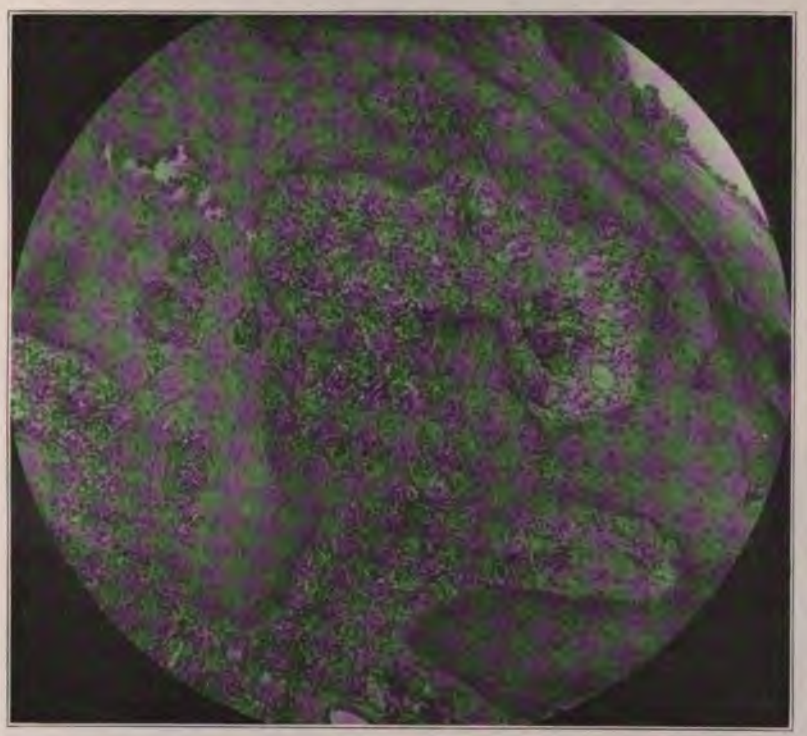

Fig. 884.—Blastomycetic dermatitis. Low magnification. Showing epidermal hypertrophy and multiple abscesses. (Courtesy of Dr. H. H. Hazen.)

or less scarring usually ensues, however, particularly if extensive areas are involved. The possibility of systemic infection should always be borne in mind.

Treatment.—The best results have followed the administration of potassium iodide in large doses, and the local application of the x-rays. Of the various parasiticides that have been suggested, tincture of iodine is one of the best. Bevan recommends a 1 per cent aqueous

solution of copper sulphate. In a recent case, I found a saturated aqueous solution of pyoktannin blue valuable. Thorough and deep freezing with carbon dioxide snow often proves helpful. In the systemic forms, it is possible that a vaccine would prove beneficial.

Fig. 885.—Blastomycosis cutis, showing downgrowth of epidermis and minute abscesses. Low magnification. (Ricketts.)

Fig. 886.—Dermatitis coccidioides. (Courtesy of Dr. William Allen Pusey.)

The term "*dermatitis coccidioides*" or "*coccidioidal granuloma,*" has been applied by Ricketts, D. W. Montgomery, Howard Morrow, Ryfkogel, and other observers on the Pacific Coast to a form of cutaneous disorder which in many respects simulates blastomycosis. The cutaneous lesions are frequently secondary to internal infection, however, and the disease tends strongly to become systemic and end fatally. The organism multiplies by endogenous spore formation, and budding has not been seen. Therapeutically, potassium iodide exerts little or

Fig. 887.—Coccidioidal blastomyces. An apparently adult organism containing numerous segmentations. The prickles on the capsule are distinct. The center is yellowish-brown. (Courtesy of Dr. William Allen Pusey.)

no effect on the course of the disease. Its exact relationship to blastomycosis and other of the oïdiomycoses is still a matter of controversy.

C. G. Lane has recently described a form of dermatitis in which the lesions were produced by a new fungus, the *Phialophora verrucosa.* Clinically the affection simulates tuberculosis verrucosa cutis, while histologically it closely resembles blastomycosis cutis. On culture media a branching, septate, grayish-brown mycelium was observed,

the individual cells of which were 8-25 microns in length, and 2- microns in diameter. Reproduction was asexual and the fungus wa non-pathogenic to guinea-pigs. In rats and mice a chronic skin lesio was produced similar to that seen in man.

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PHIALOPHORA VERRUCOSA. —*Lane*, Jour. Cutan. Dis., 1915, p. 840.

SPOROTRICHOSIS.

Definition.—An infectious, parasitic disease, due to a species o sporothrix, and characterized by the formation of multiple abscesse in the skin and subcutaneous structures, and, occasionally, in one o more of the internal organs.

The malady was first described by Schenck in 1898. Since that time numerous cases have been reported from various parts of the world, particularly America and France. In this country, the affec tion has been studied by Hektoen and Perkins, Brayton, Hyde and Davis, Hamburger, Meyer, Wahrer, Henderson, Blaisdell, Soloman Seitz, Moore and Davis, and others; in France by de Beurmann and his associates, and in Germany by Arndt.

Symptoms.—As encountered in America, the disease commonly involves only the skin, or the skin and subcutaneous structures, and

the extremities and the face are favorite sites of attack. In many instances, the infection follows some trifling injury, as a small incised or punctured wound. Davis and Moore have reported a case which developed following a mouse bite; and in one of my own patients, the original wound was due to the peck of a chicken. In the course of several days or weeks a chain of subcutaneous nod-

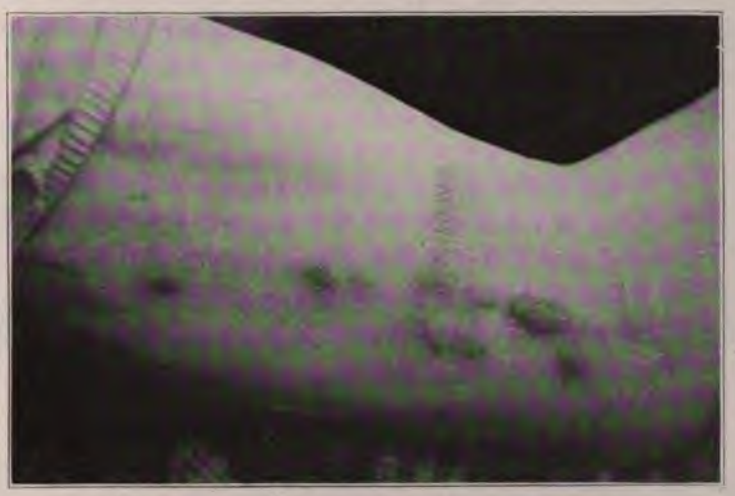

Fig. 888.—Sporotrichosis, showing typical abscesses on upper arm. (Courtesy of Dr. Arthur E. Hertzler.)

Fig. 889.—Sporotrichosis, showing ulcers left after incision of lesions.

ules develops along the course of the lymphatics draining the part, and these gradually soften and break down in the center, giving rise to a series of small, sharply circumscribed, painless, subcutaneous collections of pus. Ultimately, a few or several of these abscesses may break through the overlying epidermis with resultant formation of fistulae. Not infrequently, two or more of the

cavities are connected by tortuous, subcutaneous channels. The al scesses develop very slowly, and contain yellowish, brownish c grumous, mucopurulent matter. Clinically, they at first resembl small gummata, and the disease has often been mistaken for syphili or tuberculosis. The lesions may heal spontaneously, but as a rul they are exceedingly persistent. De Beurmann and Gougerot separat the disorder into several clinical varieties, chief among which ar the "syphiloid" and "tuberculoid" forms, and the giant abscess typ of Dor. The character of the initial lesion varies greatly. Gen erally it resembles that of syphilis in some respects, although the

Fig. 890.—Sporotrichosis. Primary lesion on little finger. Lesions have been incised, and only the ulcers remain. (Courtesy of Dr. Q. M. Brown.)

Fig. 891.—Sporotrichosis of arm, showing characteristic lesions. (Courtesy of Dr. Arthur E. Hertzler and Dr. J. M. Sutton.)

lymphnode involvement which is so typical of lues is absent in sporotrichosis. The mucous membranes as well as the skin may be attacked, and in some of the cases reported from France, the muscular and osseous structures and even the lungs were involved. Visceral implication has been recognized in the rat, but never in man.

Etiology and Pathology.—The causative organism is an aërobic fungus, for which Smith first suggested the designation of "sporotrichium schenckii." In only a very few instances have the mycelia been recovered directly from the abscesses or tissues in man. The parasite grows readily on ordinary culture media, and has been isolated from the blood of individuals suffering from the cutaneous form

of the disease. In cultures it consists of long, slender mycelia and minute, rounded or oval spores. The disorder is pathogenic to animals as well as man, the horse, cat, mouse, rat, monkey, and guinea-pig being susceptible. It is very probable, however, as Meyer has suggested, that man seldom if ever contracts the equine variety of

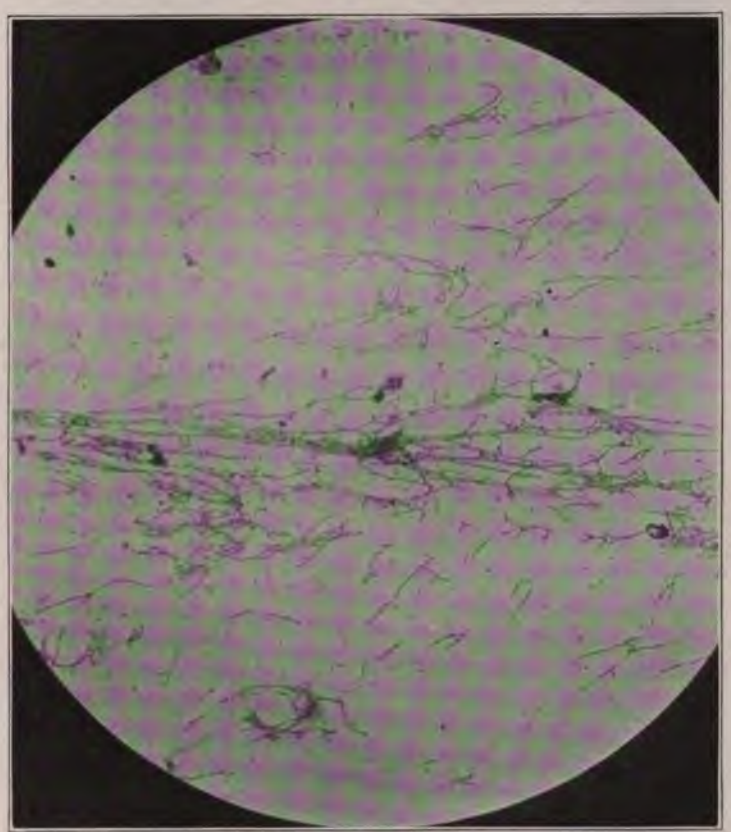

Fig. 892.—Sporothrix. Glucose agar culture, five days old. Low magnification.

the disorder. Several different species of the organism have been isolated in different parts of the world; the most common being the *S. schenckii,* the *S. beurmanni,* the *S. dori,* the *S. gougeroti,* the *S. jeanselmi,* and the *S. indicum.* Castellani, who first isolated the last named species, states that possibly it is only a variety of *S. beurmanni.* Judging from the results of my own laboratory studies in a dozen or more cases of the disease, I believe it extremely probable that Castel-

lani's observations are correct, and that, in addition, many, if no all, of the numerous French varieties properly belong in the sam category. Meyer and Aird, in a recent communication, state tha the sporothrix schenckii is identical with the sporothrix beurmanni

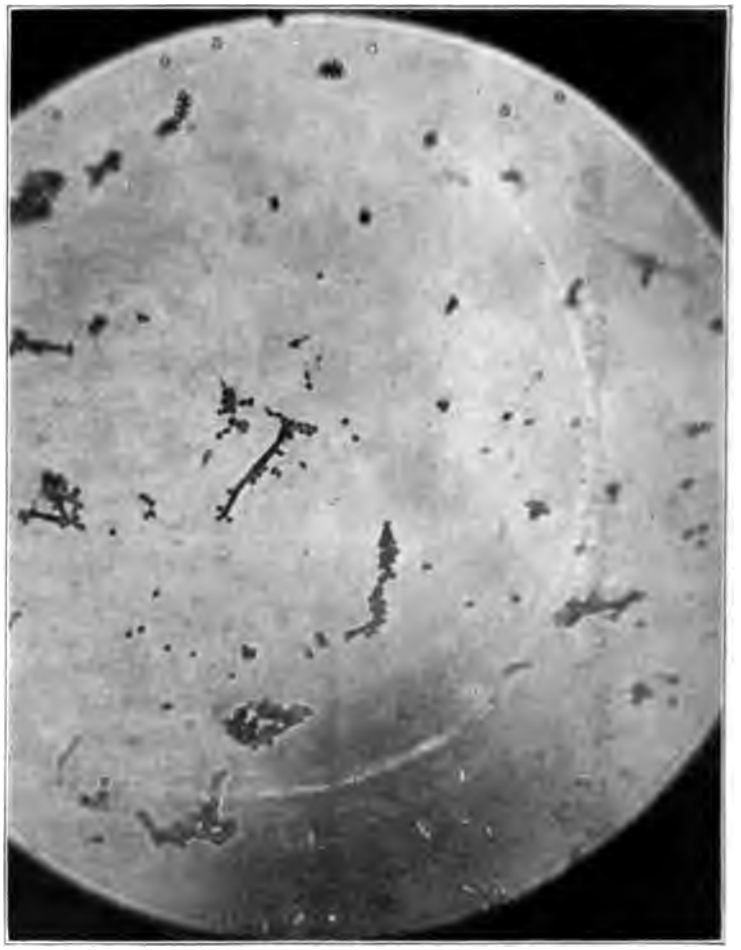

Fig. 893.—Sporothrix, from a seven-day agar culture. Mycelia and spores are shown. High magnification.

and suggest for the American strains of pathogenic sporotrichia the designation of "sporothrix schenckii-beurmanni."

Recently, Wolbach, Sisson, and Meier have recovered and isolated what is probably a new type of organism from a case of acute arthritis. They have named it S. Councilmani.

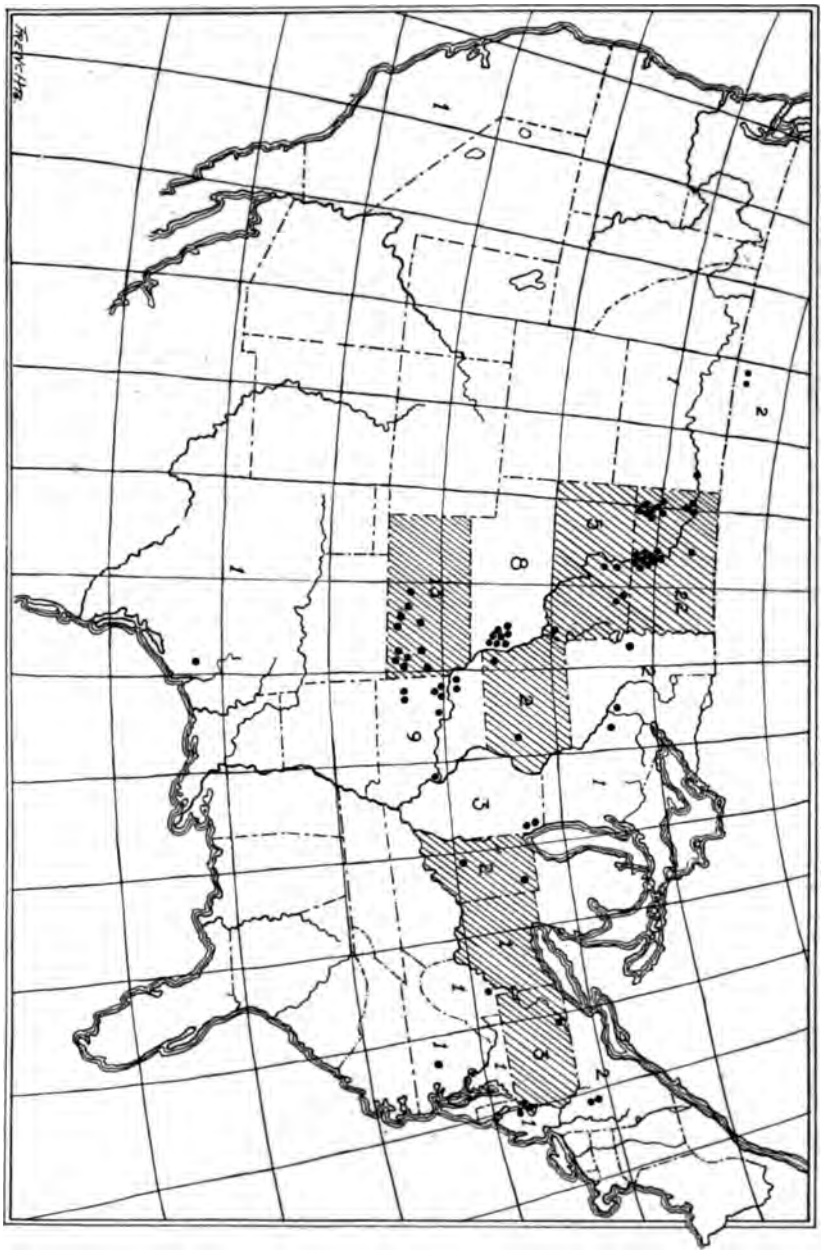

Fig. 894.—Map showing distribution of reported sporotrichosis cases in the United States. (Courtesy of Dr. K. F. Meyer.)

Histologically, the lesions are not clearly defined, and may simulate those of syphilis, tuberculosis, or pyogenic infection (ecthymaform).

Diagnosis.—A traumatic lesion of the hand, forearm, or leg which proves resistant to ordinary surgical treatment, and is accompanied by the development of one or more sharply circumscribed, painless, cutaneous or subcutaneous abscesses along the course of the limb, should always arouse suspicion, especially if the inflammatory manifestations typical of a streptococcic cellulitis are absent. A microscopic examination of the contents of the abscesses is usually negative, although the organism multiplies readily on agar and other simple culture media.

In France it has been found that the disease occurs more frequently in the rural districts than in the cities (owing to the fact that the sporothrix thrives best on vegetable matter, thus affording abundant opportunity for the infection of slight open wounds on the hands and arms of farmers and others of similar occupation). Tuberculosis of the skin, syphilis, cellulitis, and blastomycosis are to be excluded.

Prognosis and Treatment.—Iodine, internally, in the form of the sodium or potassium salt, and locally, in the form of the tincture, or diluted Lugol's solution, is specific. Surgical intervention is seldom necessary, and when resorted to, generally retards rather than hastens the disappearance of the disease.

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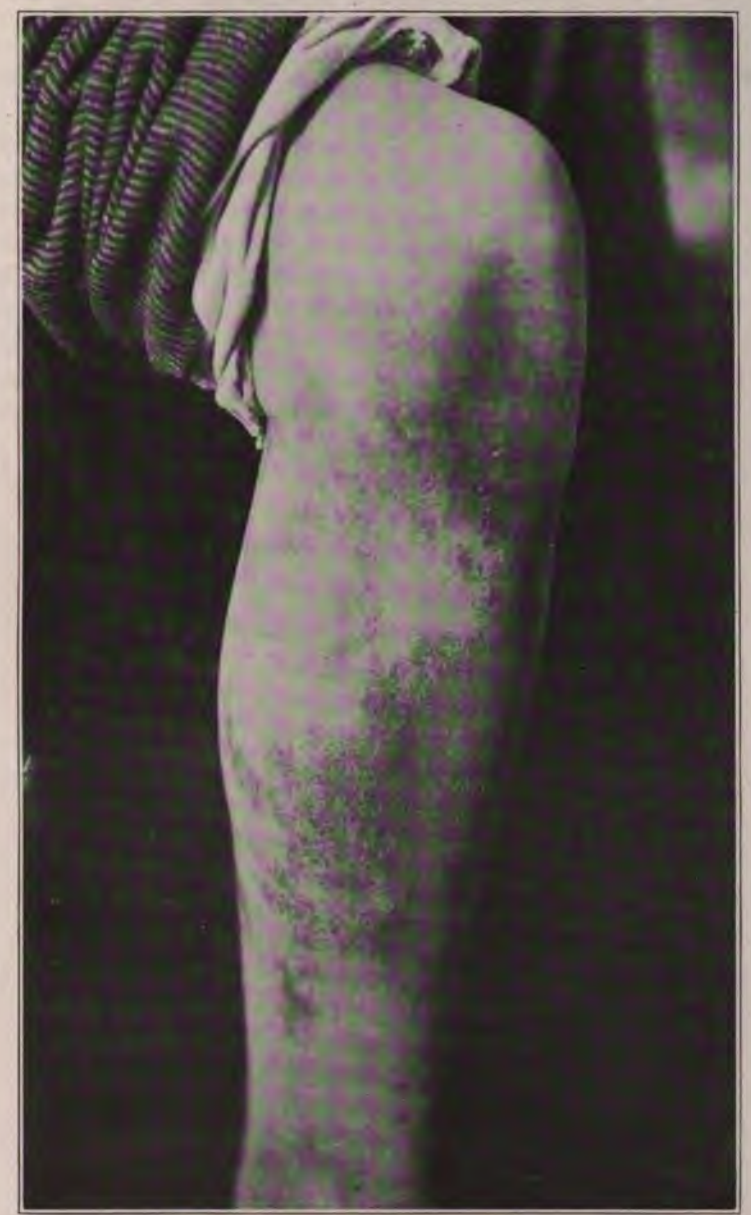

Fig. 895.—Schamberg's progressive pigmentary dermatosis. (Courtesy of Dr. J. F. Schamberg.)

SCHAMBERG'S DISEASE.

Schamberg has described a peculiar, chronic disorder of the s which begins as pinhead, reddish points or dots forming irreg patches, which slowly extend by the formation of new lesions u the periphery. The puncta in the course of time disappear, leav behind a brownish, brownish-yellow, or reddish-brown pigmentat which slowly fades. The disease involves distant areas of the inte ment, and is progressive in character. Spontaneous involution curs in the oldest areas, and it is probable that in time a comp restoration to the normal condition of the skin may take place. Th is an entire absence of subjective symptoms. The pathological pro has its chief seat in the subpapillary layer of the corium, particu ly in the immediate vicinity of the coil gland ducts. Little repo a similar case in 1902, and Kingery, a typical example in 1918.

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SCHAMBERG'S DISEASE.—*Schamberg*, Brit. Jour. Dermat., 1901, p. 1. — ***Little***, Brit. Dermat., 1902, p. 37. — *Kingery*, Jour. Cutan. Dis., 1918, p. 106 (with histologic study. ably a hemosideric disease, secondary to a localized disturbance of circulation).

CLASS XI.—DISEASES OF THE MUCOUS MEMBRANES ADJOINING THE SKIN.

LEUKOPLAKIA.

Synonyms.—Leukokeratosis buccalis; Leukoplakia buccalis; Smokers' patches; Psoriasis linguae; Ichthyosis linguae.

Definition.—A chronic disorder of the tongue and buccal mucosa, characterized by rounded, oval, or irregularly shaped, indurated, whitish patches, which occasionally exhibit a tendency to fissuring, and which ultimately may become carcinomatous.

Similar lesions sometimes develop in the vagina, or on the genitals of either sex.

Symptoms.—The most frequent sites for the patches are the dorsum of the tongue, and the inner surfaces of the cheeks, at the interdental lines. The earliest manifestation is that of a localized irritation, with increased sensitiveness to hot and irritating substances. Redness, frequently with associated accentuation of the papillae, follows, and in the course of weeks or months the lesions become apparent to the eye as sharply defined, variously shaped, whitish or slate-colored, pinhead- to pea-sized or larger plaques, which give rise to more or less stiffness and immobility of the affected parts, but seldom cause any pain. Two or more of the lesions may coalesce to form a single large patch. Ultimately, owing to the lack of flexibility of the part, fissuring almost invariably occurs, and in the course of years ulceration and malignancy are not infrequent sequelae. The ensuing carcinomata are usually of the prickle-celled type, although growths analogous to the basal-celled variety are of not infrequent occurrence on the hard palate and the inner surface of the cheeks.

Etiology and Pathology.—Syphilis is an important causative factor in many instances. Irritation from rough-edged, carious teeth is at times responsible for the development of the lesions, and indulgence in tobacco, alcohol, and highly spiced foods frequently serves to aggravate, if not to initiate, the condition. Males are attacked more frequently than females, and adults are far more susceptible than children. Histologically, there is parakeratosis, and acanthosis of variable degree. The papillae are infiltrated and smaller at first, but

later exhibit atrophic changes, and ultimately they may almost en tirely disappear.

Diagnosis.—The history, character, localization, and tediou course of the lesions should serve to distinguish them from lupus ery thematosus and lichen planus of the mouth, and mucous patches. A a rule, neither lichen planus nor secondary syphilis involves this re gion alone, and a careful search will reveal evidence of their pres ence somewhere on the general cutaneous surface.

Prognosis and Treatment.—Leukoplakia, particularly if of wid extent and long duration, is extremely rebellious to treatmen and many cases are practically incurable. The possibility of cancer

Fig. 896.—Leukoplakia of tongue. (Courtesy of Drs. Fordyce and MacKee.)

ous involvement should always be borne in mind. The patient' teeth should be examined by a competent dentist, and treatment in stituted if needed. Abstinence from tobacco and similar irritants is an important measure. A concomitant syphilis should receive appro priate attention. Locally, mild astringents and alkaline mouth washes may be employed in the earlier stages of the disease. Pencil ing with silver nitrate, or the daily application of a saturated aque ous solution of pyoktannin blue (Pierce), or of methylene blue (Las sar), may prove helpful. Unna has found resorcin, in ointments or in solution, of value. In long-standing and advanced cases, more vig orous measures are indicated. Vidal employed a 20 percent. solution of chromic acid, and Sherwell an undiluted solution of acid nitrate of mercury, while Stelwagon recommends the actual cautery. In employ

ing such agents as liquor hydrargyri nitratis, every precaution must of course be exercised to safeguard the neighboring structures. The mouth is stuffed with cotton to protect the adjacent parts, and the remedy carefully applied with a small swab, and allowed to remain for a few minutes. It is then neutralized with sodium bicarbonate. Thorough freezing with carbon dioxide snow occasionally proves curative. During the past ten years the x-rays have been employed in many instances with much resultant benefit. Radium is even a

Fig. 897.—Leukoplakia involving lips and gums.

more effective agent, an exposure of 15 mgm. hours often proving sufficient to bring about a cure in mild cases. In extensive cases relapses and recurrences are common, however, no matter what plan of treatment is adopted.

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FURROWED TONGUE.

Synonyms.—Lingua plicata; Grooved tongue.

This peculiar condition may be acquired or congenital. In some instances it is apparently hereditary, and several members of a family may be affected.

The tongue is generally larger than normal and may be of extraordinary size (macroglossia). The grooves are due to plication of the mucous membrane, and are arranged in a variable manner. As a rule there is a deep longitudinal furrow running down the center of the organ, with shorter grooves coming off laterally, not unlike the veins of a leaf. In the milder instances, the wrinkles are superficial in character, and often are discovered only by accident. In pro-

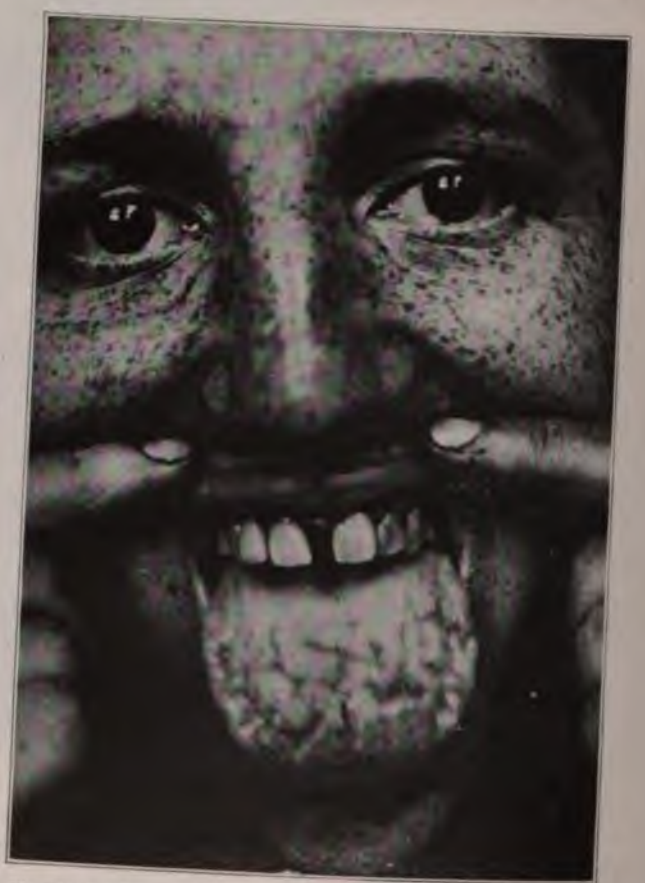

Fig. 898.—Furrowed tongue. (Courtesy of Dr. J. E. Lane.)

nounced examples of the disorder the deformity may be very considerable, however, with resultant lodgment of particles of food and other foreign matter in the sulci. Aside from the cases which develop as a result of heredity, glossitis of syphilitic or other origin is the most frequent causative factor. Aside from the ever-present possibility of malignancy as a result of long-continued irritation, the disorder seldom gives rise to serious trouble. Treatment consists of the frequent employment of mild alkaline and antiseptic mouth washes. If superficial ulceration develops, apply a weak solution of silver nitrate.

REFERENCE.

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BLACK TONGUE.

Synonyms.—Hairy tongue; Lingua nigra.

This peculiar and striking disorder was first accurately described by Rayer in 1835. The affection is a comparatively rare one, only about fifty authentic instances being on record. Clinically, the malady is characterized by yellowish, brownish, blackish or bluish discoloration of the affected areas, usually with accompanying papillary hypertrophy of variable degree. The papillary overgrowth results in the formation of long, slender, hair-like, filiform projections, which present an appearance comparable to that of a wind blown field of small grain. Various parts of the surface may be attacked, although the area lying immediately anterior to the circumvallate papillae seldom escapes.

The malady may develop quickly or slowly, and the duration of an attack also is variable. Subjective symptoms usually are absent. Heidingsfeld, who has exhaustively investigated the disorder with the aid of modern laboratory methods, concludes that hairy tongue can be conveniently divided into two general classes: (1) true, idiopathic, or genuine cases, characterized by well-defined stable, black-brown or yellow-brown, thick, soft, fur-like patches covered with densely intertwined hair-like filaments, measuring from one-fourth to one-half of an inch in length; and (2) false, pseudo or spurious cases, characterized by thickish, yellowish-brown or greenish discolorations, of unstable evanescent character, covered with a soft, mushy detritus, occasionally containing short filaments measuring one-eight to one-fourth of an inch in length. The true cases he believes are due to developmental anomalies, and the pseudo or spurious cases to local or general irritating and infectious causes as tobacco, antiseptics,

astringents, and syphilis. The filaments are probably due to an i flammatory hypertrophy of the papillae filiformes. The results Heidingsfeld's studies convinced him that a parasitic origin for t affection could not be established on clinical, histopathologic bacteriologic grounds. The discoloration is probably due to the pr ence of chromogenetic bacteria.

Prognosis and Treatment.—The disorder is a harmless one, a generally disappears spontaneously in the course of months or yea Its course and duration are affected but little by treatment. Asi from the maintenance of cleanliness, and the avoidance of tobac and hot and acid foods and similar irritants, little is to be suggest in the way of therapy. It is extremely questionable if the applic tion of chromic or lactic acid and similar chemicals is justifiable so innocent a malady. Should the use of agents of this character see justifiable, thorough freezing with Pusey's carbon dioxide snow m be tried.

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TRANSITORY BENIGN PLAQUES OF THE TONGUE.

Synonyms.—Erythema migrans; Pityriasis linguae; Glossitis area exfoliativa; Exfoliatio areata linguae; Geographic tongue.

Definition.—A recurring, inflammatory disorder of the tongu characterized by the development of superficial, circinate lesion which pursue an acute course and disappear leaving no trace.

The affection is a fairly common one. The majority of the reporte cases have occurred in children. The eruption is usually confined to th dorsum of the tongue, and consists of one or more small, sharply de fined, grayish plaques which spread peripherally, with superficial ex foliation of the involved mucous membrane. The central portion i beefy red in color, and the margin of a grayish or yellowish hue After attaining a diameter of about 1 cm., the lesions tend to clea up in the center, and ultimately disappear, leaving no trace. Rare ly, concentric rings may be formed. Two or more patches ma coalesce, giving rise to the intricate, polycyclic figures which con stitute the condition known as "geographic tongue." The duratio of an individual lesion is short, from two to seven days. Slight itch ing may be present, but as a rule subjective symptoms are absent.

Etiology and Pathology.—The exciting cause of the malady is un

known. Histologically, Parrot found acanthosis and parakeratosis, with edema of the rete, and perivascular and cellular infiltration of lymphoid cells in the papillary and subpapillary layers of the corium.

Diagnosis.—Leukoplakia, and the mucous patches of secondary syphilis are readily excluded.

Prognosis and Treatment.—The disorder is a persistent one, prone to relapses and recurrences. A careful regulation of the dietary is advisable. Of the various constitutional remedies, Hartzell found arsenic helpful. In Stelwagon's two cases, the occasional administration of a laxative antacid, as calcined magnesia, proved beneficial. Locally, soothing, astringent and antiseptic washes, as lotions containing borax, tannin, or potassium chlorate, may be prescribed. Unna found applications of sulphur helpful in combating the disorder, and Besnier has recommended the frequent application of ointments containing boric acid and balsam of Peru.

Fig. 899.—Erythema migrans. (After Mikulicz and Kummel.)

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SUPERFICIAL ATROPHY OF THE MUCOUS MEMBRANES OF THE MOUTH AND TONGUE.

Hazen has described two cases of atrophy of the mucous membranes of the mouth and tongue in which there was at no time any perceptible sign of inflammation present. The affected areas were rounded or oval in out-

line, glistening white in color, free from induration, and bore some r semblance to atrophic scars. Sensation in the patch was slightly dull but in no way abnormal. Syphilis as a causative factor was exclude Bloodgood has seen similar cases. There were no subjective sympton

REFERENCE.

SUPERFICIAL ATROPHY OF MUCOUS MEMBRANES OF MOUTH AND TONGUE.—*Hazen*, Jour. Cut Dis., 1916, p. 801.

CHRONIC SUPERFICIAL EXCORIATION OF THE TONGUE.

Synonym.—Moeller's glossitis.

In 1851, Moeller first described a chronic inflammatory disorder the tongue characterized by the formation of irregular, usuall

Fig. 900.—Chronic superficial excoriation of the tongue. Typical case. (Courtesy of Dr. Frederick G. Harris.)

sharply defined, intensely red spots, from which, apparently, the epithelium had desquamated or at least become greatly thinned, and in which the papillae appeared thin and swollen, and therefore some what elevated above the normal.

The areas never showed an abnormal secretion, or became ulcerated. They exhibited a slight tendency to extend laterally, but persisted

in the same size and outline despite all treatment. The subjective symptoms varied considerably. In some of Moeller's cases and in other reported instances the patients complained of severe and persistent burning, and in others there were paroxysmal attacks of lancinating pain. The ingestion of acids and highly spiced foods usually gave rise to great discomfort. Cold foods are more irritating than hot. There is no disturbance of taste. The sensibility of the tongue is unaffected. Treatment is entirely unsatisfactory. It is possible that x-ray or radium therapy would prove of value.

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CHEILITIS GLANDULARIS APOSTEMATOSA.

Synonyms.—Cheilitis glandularis; Myxadenitis labialis.

Definition.—A chronic disorder of the lips, characterized by swelling and edema of the part, with hypertrophy of the mucous glands, and dilatation of the glandular orifices.

The affection was originally described by Volkmann in 1870, and since that time has been studied by Purdon, Howard Fox, Schamberg, Wise, and myself.

Symptoms.—Clinically, the affection is characterized by a thickened and edematous condition of one or both lips, more often the lower only, with hypertrophy of the mucous glands and enlargement of the ducts. When the lip is everted, it is possible to see these widely dilated, sieve-like openings, irregularly scattered over the vermilion border. When pressure is applied over the glands, a glistening secretion exudes which resembles drops of dew on the previously dried surface of the lip. When the lip is compressed between the finger and thumb, the enlarged ducts and appended glands can be plainly felt and outlined beneath the mucous membrane. Many of the glandular orifices are dilated sufficiently to admit the rounded end of an ordinary silver surgical probe. In a few of the reported instances abscesses have developed, but this complication is unusual. There is generally an associated catarrhal inflammation of the buccal and pharyngeal mucosa, and concomitant hypertrophy of the turbinates and tonsils is present in the majority of instances. Adenoids also are a frequent complication. For more than a quarter of a century the malady was supposed to be a very rare one, but it is probable that many cases

were overlooked, or remained unrecognized. Mild forms of the disorder are fairly common, and even pronounced examples are not unusual. Fully a dozen well-developed cases have come under my observation during the past five years.

Fig. 901.—Cheilitis glandularis apostematosa.

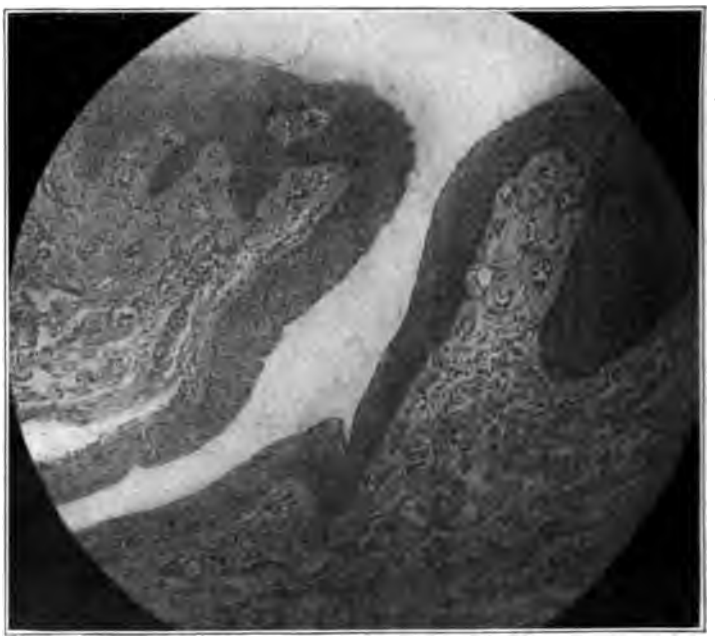

Fig. 902.—Cheilitis glandularis apostematosa, showing hypertrophied duct of a mucous gland. Low magnification.

Etiology and Pathology.—The essential cause of the malady is unknown, but it is extremely probable that the condition is of congenital origin, being simply one of the manifestations of an excessive supply of glandular tissue to the nose, pharynx, mouth, and lips.

Histologically, I found an enormous dilatation of the ducts of the mucous glands, with thickening of the walls. The hypertrophic changes were to be seen in the acini as well as the ducts, and in some of the appendages the glandular substance was greatly increased in amount. The cells of the acini were chiefly of the mucous variety, in an active state of secretion, although considerable numbers of serous cells also were observed. The adjacent papillae also were increased in size. The alterations in the corium were surprisingly slight. There were some degenerative changes in the connective tis-

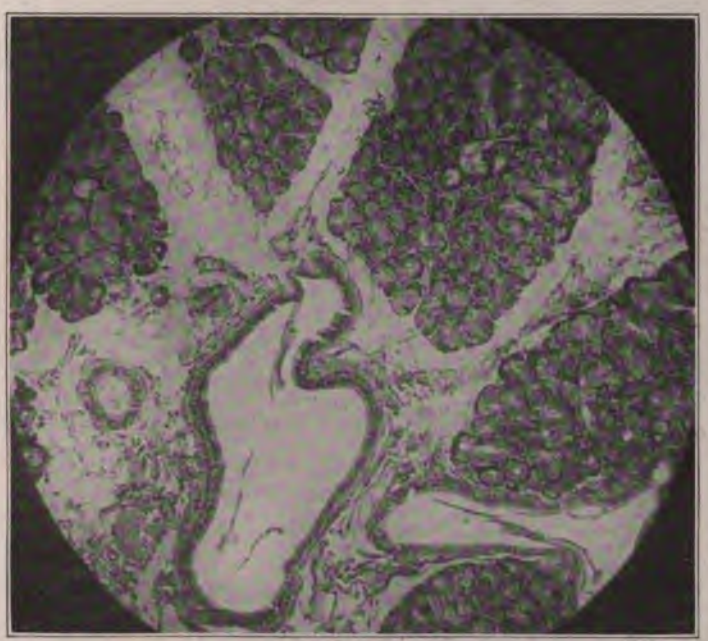

Fig. 903.—Cheilitis glandularis apostematosa, showing hypertrophied mucous glandular tissue. Low magnification.

sue, but they were not so marked as to be particularly noticeable. The elastic fibers were increased both in size and number, as compared with tissue from a normal lip, but the arrangement was unchanged. There was considerable thickening of the interacinal connective tissue. It is very probable that this hypertrophy, together with the enlargement of the ducts, is what gives the impression of shot-bag-like resistance to the finger when a case is examined clinically.

Diagnosis.—The enlargement of the glands and ducts, the charac-

teristic sieve-like appearance of the lip, and the chronic nature of tl disorder should serve to prevent confusion.

Prognosis and Treatment.—The disorder is a persistent but benig one, and, aside from the deformity to which its presence gives ris is comparatively harmless. Three of Volkmann's patients recovere under the use of potassium iodide, but none of the other cases r ported have been cured by this or any other drug. The condition (my first patient was benefited by a long series of exposures to tl x-rays, but I have found the most satisfactory method of treatmer to be excision of the individual lesions by means of a small cutaneo punch. The resulting wounds generally healing readily and witho incident.

REFERENCES.

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RETENTION CYSTS OF THE MUCOUS MEMBRANE OF THE LIP.

Simple retention cysts of the mucous membrane of the lip vary i size from that of a pinhead to that of a small hazelnut. The mo common location is the lower lip, at a point overlying the left cuspi tooth. The lesions are somewhat paler than the normal mucous men brane, owing to the character of their contents and to pressure, an are painless. Frequently, their presence is discovered only throug accident. When they are incised, a whitish, glairy, ropy fluid escape If the opening be allowed to close, the cyst promptly refills.

It is probable that the majority are traumatic in origin. Histolo ically, simple retention cysts in this locality are due to dilatation of on or more of the ducts of the labial glands of Sebastian. These canals ar also the ones involved in cheilitis glandularis apostematosa.

Treatment.—Brophy recommends incision, evacuation, and the a plication of tincture of iodine, or oil of cassia, or cauterization wit zinc chlorid or phenol. Acting on a suggestion of Pusey's, I hav employed the actual cautery with uniform success in a number cases.

REFERENCES.

RETENTION CYSTS OF THE MUCOUS MEMBRANE OF THE LIP. *Brophy*, Oral Surgery, Pros 1915, pp. 847 and 1058. *Sutton*, Jour. Cutan. Dis., 1918, p. 579 (with bibliography. Discussion by Pusey and Shelmire).

PLATE XI.

Simple Retention Mucous Cyst of the Lip.

CHEILITIS EXFOLIATIVA.

A chronic disorder of the lips which was probably first described by Rayer, under the title of "pityriasis des lévres," and later by Besnier as "eczema exfoliant des lévres," and which has become familiar in recent years through the contributions of Stelwagon, who has suggested for it the now generally accepted designation of "cheilitis exfoliativa."

Although well-defined examples of the condition are not uncommon, only a few separate instances have been recorded. In addition to the cases described by Stelwagon, Ravitch has reported four examples of the disorder, and MacLeod, Trimble, Ochs, Gaskill, and others have contributed to our knowledge of the malady.

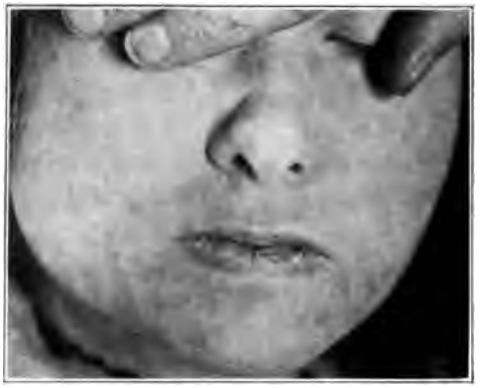

Fig. 904.—Cheilitis exfoliativa.

The disease is characterized by a chronic inflammatory process which involves the border of one or both lips, with the formation of slight, dry, adherent scales and crusts. There is very little if any thickening, and the bright redness, itching, and liquid exudation distinctive of an eczema are wanting. Exacerbation and improvement may be noted from time to time at irregular intervals. Neighboring areas on the skin occasionally are attacked, and, in a few instances, the dorsum of the tip of the tongue, and the buccal mucous membrane adjoining the lips have been involved. There is frequently present a concomitant seborrheic dermatitis of the face and scalp.

Etiology and Pathology.—The condition has been variously ascribed to seborrheic dermatitis, lupus erythematosus, and chronic eczema. The consensus of opinion at this time favors the first named disorder.

In two cases of the disorder I found parakeratosis, with the nuclei, which were elongated and slender, lying parallel to the surface of the skin. The line of demarcation between the horny and granular strata was clear and distinct, but the cells comprising the latter layer were not so sharply outlined as in normal tissue, and many of the nuclei stained poorly and unevenly. Both the transitional and prickle layers were thicker than usual, the acanthosis persisting throughout the affected area. Many of the cells in the lower part of the prickle

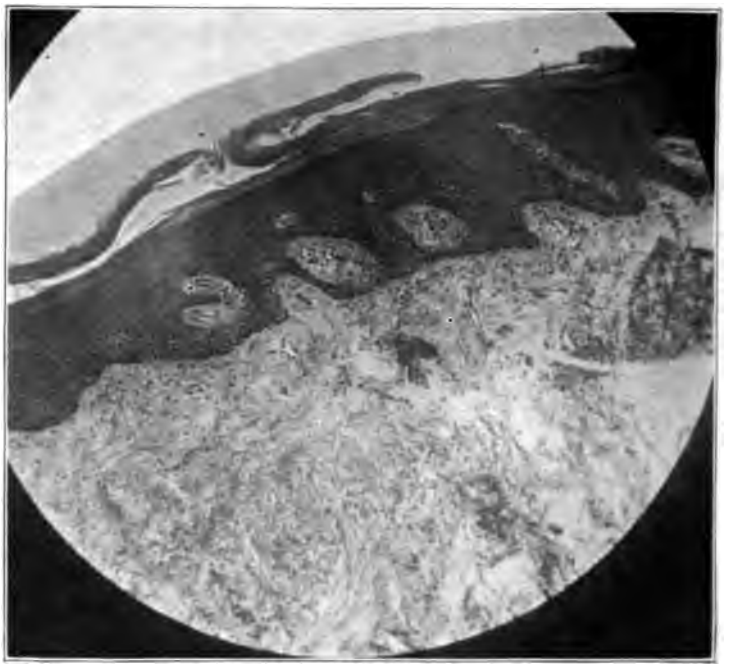

Fig. 905.—Cheilitis exfoliativa. Low magnification.

layer presented numerous peculiar, clear spaces, which almost or completely surrounded the nuclei, as if the cell substance had shrunk away from the nucleus, or the latter had shrivelled up, and pulled away from the intracellular substance which formerly closely encompassed it. The rete cells were swollen, and irregular in size and shape. Only a few exhibited mitotic changes. The papillae also were slightly swollen, and densely infiltrated with leucocytes and small round cells. The intrapapillary blood vessels were dilated, and the lymph channels were wider than normal. Considerable numbers of

plasma cells were scattered about through the upper regions of the corium. The elastic tissue was unchanged.

Prognosis and Treatment.—The condition is rebellious to treatment, and tends to recur even after apparent cure. Stelwagon found a sulphur ointment, employed conjointly with a resorcin lotion, helpful. In one instance I employed carbon dioxide snow with success. Pusey, Morris, Ormsby, and others, including myself, have noted improvement or cure following the use of x-rays. In a recent case under my observation, the condition disappeared promptly following a radium exposure equivalent to 15 mgm. hours.

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FORDYCE'S DISEASE.

Synonym.—Pseudocolloid of the lips.

In 1896, Fordyce first called attention to a chronic disorder of the lips and inner surfaces of the cheeks, characterized by the appearance of discrete, yellowish, milium-like lesions on the affected surfaces. The condition is a relatively common one, and has been investigated histologically by Fordyce, Montgomery and Hay, Audry, C. J. White, and others, including myself.

The lesions are minute, pinpoint- to pinhead-sized or larger, whitish, yellowish, or chamois-skin colored tumors, which may project slightly above, but generally lie flush with the surface of the mucous membrane. As a result of coalescence, patches of variable size may be formed. The inner surfaces and vermilion borders of the lips frequently are affected, and one or both cheeks may be involved. Subjective symptoms are usually lacking, although slight burning and itching may be present.

Etiology and Pathology.—It is probable that the lesions are directly due to the presence of aberrant sebaceous glands in the buccal mucosa. Fordyce and White hold that the milium-like formations are due to localized granular changes in the rete cells, while Montgomery and Hay, Audry, Heuss, and others believe that the tumors are identical with the abnormal sebaceous glandular elements in the epidermis and corium, and that the yellowish coloration is due to

the collections of fatty matter in the rete. The origin of the sebaceous glands is doubtful, but it is probable that Audry is correct in his supposition that they spring from invaginated, aberrant buds dating back to fetal times. In a case under my own observation, some of the specimens exhibited cellular masses projecting downward from the rete in such a manner as to suggest the development of a new glandular system. Structurally and tinctorially the constituent cells were identical with those found in normal sebaceous glands.

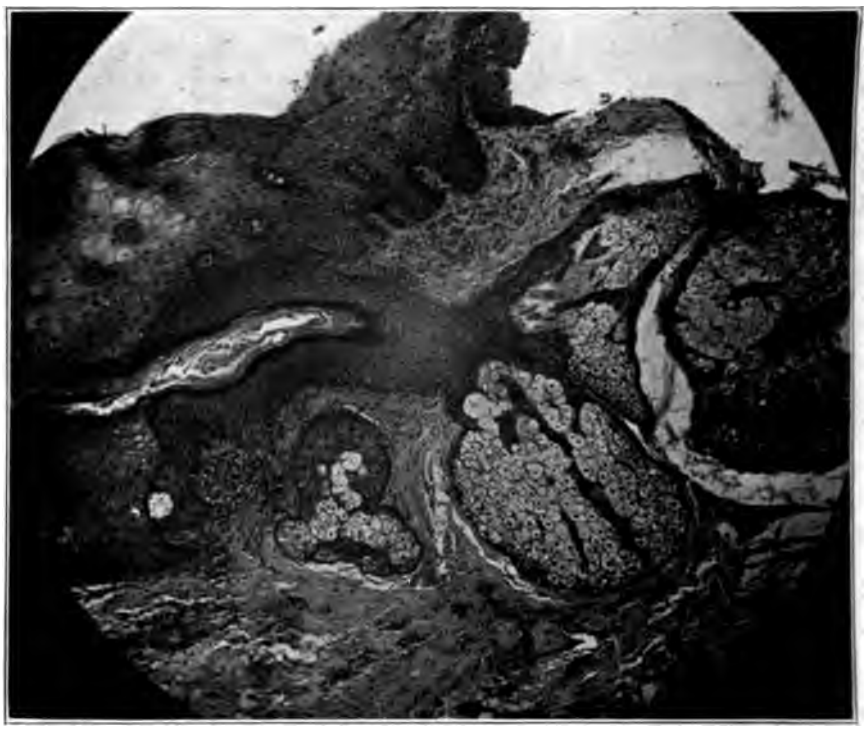

Fig. 906.—Fordyce's disease. Section from mucous membrane of cheek, showing sebaceous glands and duct. Low magnification.

Prognosis and Treatment.—The condition is a harmless one, and the discovery of its presence is usually accidental. Should the lesions give rise to discomfort or inconvenience the superficial ones may be curetted away, or destroyed by thorough freezing of the part with Pusey's carbon dioxide snow.

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LA PERLÈCHE.

Perlèche is an affection of the lips, usually bilateral, located at the labial commissures. The mucous membrane is thickened and appears somewhat macerated. The lesions are most marked on the red border of the lips, but usually extend a short distance onto the true mucous membrane of the mouth and also onto the skin surface. They are limited to the angles of the mouth and are very rarely, if ever, found

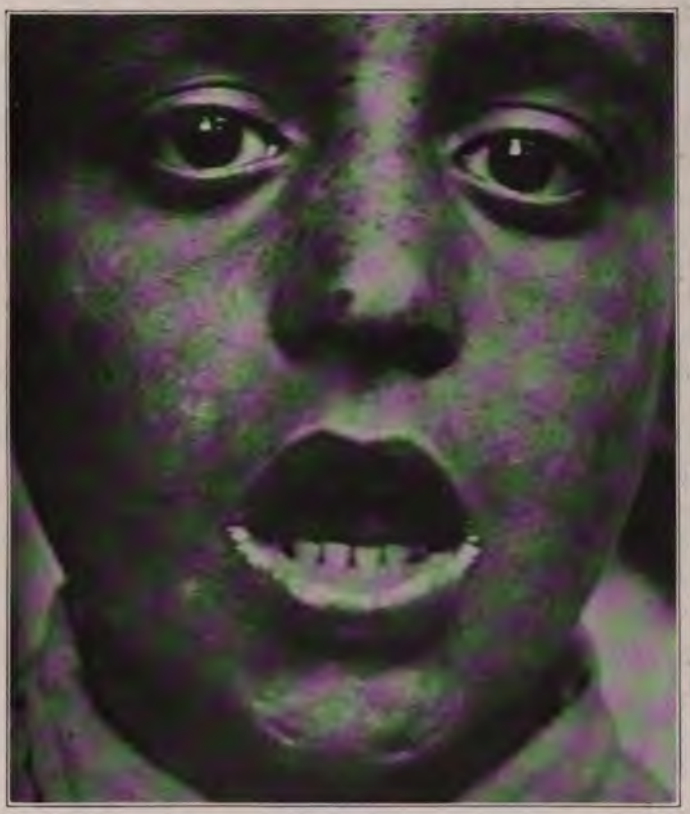

Fig. 907.—Perlèche, showing typical lesions at corners of mouth. (Courtesy of Dr. J. E. Lane.)

in the center of the lips. The color of the lesions is nearly that of mother of pearl. The mild cases show slight wrinkling of the surface, the more advanced ones present deeper wrinkles and often transverse fissures with red bases, easily seen when the membrane is stretched by opening the mouth. These fissures very rarely bleed.

Even in the most marked cases the disease is strictly local. The extension is in depth rather than laterally. There is no neighboring inflammation, no areola of redness, no lymphangitis, and no glandular involvement, even in the submaxillary region.

Perlèche is chiefly a disease of childhood, though it is not infrequently found in adults. Subjective symptoms are very slight or entirely lacking. There is no itching, and the children have no tendency to keep carrying their fingers to the lesions, though in some cases they continually run the edge of the tongue over them. In the milder cases there is no abnormal sensation.

Perlèche was first described and studied by Lemaistre of Limoges in 1885. Though this was the first description of the disease by a physician, it had undoubtedly been known for a long time to the lay inhabitants of that district, for it had acquired several names in the Limousine patois, more or less vividly describing its chief characteristics. Of these names, perlèche has come to be the one most frequently used. It is the dialect form of pourlèche, from pourlècher, meaning "to lick," and was suggested by the fact that many of the patients continually run the tongue over the lesions.

An equally characteristic and frequently used name is bridou, from brider, "to bridle," from the symmetry of the lesions and from their resemblance to the imprints made at the corners of the mouth of a horse that has worn a bit. Other names, also derived from the same patois, and occasionally used are niarde and poissonade. Outside of France also, perlèche is the name most frequently used, though the Germans sometimes call the disease Faule Ecken, "dirty corners," or geschwurige Mundwinkle, "sore or ulcerated angles of the mouth."

To one familiar with the disease the diagnosis is simple. The only things with which it can be confused are the mucous patches of syphilis. When mild, the appearance is that of the usual mucous patch. When more marked, thickened and fissured, the appearance is that of the so-called "split papule" of the corner of the mouth. This resemblance is so great that a competent observer has said that it is "not to be differentiated objectively from the corresponding types of secondary syphilis." Fournier said that "every practitioner who sees perlèche for the first time, never fails to take it for a mucous patch." However, there is a difference between them. Perlèche is a whitened maceration of the epithelium, dry when not moistened with saliva and in the sense that it does not ooze; it is adherent and wrinkled, while the mucous

patch is an erosion, very superficial to be sure, but still a true erosion. Furthermore perlèche exists alone, with no other signs, and the mucous patch in this location is always attended by some other signs of syphilis. Cracks and fissures of the lips at the angles of the mouth have a totally different appearance.

Etiology.—The location of the lesions is such that they are at all times contaminated by the various organisms, pathogenic and non-pathogenic, which inhabit the mouth. This contamination with a multiplicity of organisms has so far prevented the positive identification of the causal agent by the few who have attempted it. Lemaistre, who first studied the disease, found and described an organism, the streptococcus plicatilis, which he regarded as the specific bacterium. Further studies have made it practically certain that it is streptococcus infection, but there is considerable doubt as to whether it is always caused by one and the same organism. It is very possible that it may be caused by several different streptococci or by combinations of different bacteria. Up to the present time the disease has never been reproduced with any of the cultured organisms found in the lesions.

Perlèche is highly contagious, often affecting a whole family and frequently spreading widely in a school. In one epidemic, 42 out of 153 children in a school were affected. In another, 25 out of 245. Among the virtually proven ways of transmission are kissing, common use of handkerchiefs or napkins, common drinking cups and lead pencils. In Buenos Aires one troublesome epidemic ceased after the introduction of individual drinking cups.

Prognosis and Treatment.—If neglected, the disease tends to persist indefinitely. Painting the spots every day or two with a weak solution of tincture of iodine, or with a 10 per cent solution of silver nitrate, or touching them daily with a pencil of copper sulphate, is usually promptly effective. In the few stubborn cases that do not yield to this treatment, a 5 per cent solution of chromic acid has been recommended.

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PERIADENITIS MUCOSA NECROTICA RECURRENS.

Synonyms.—Chronic aphthae; Ulcus neuroticum mucosæ oris.

Loblowitz reported examples of this disorder in 1910. I independently investigated and described one case of the affection, several months later. The malady commences as a small, painless nodule beneath the mucous membrane of the lip, cheek, or tongue. The lesion gradually increases in size, usually with some accompanying elevation of temperature, and at the end of three or four days sloughing occurs, with the separation of a solid, mummified-looking-plug, which leaves a crateriform depression extending well down into the corium. While the lesions are in the course of development they are

Fig. 908.—Periadenitis mucosa necrotica recurrens, before separation of necrotic plug.

Fig. 909.—Periadenitis mucosa necrotica, showing the ulcer left by the removal of the plug. A smaller but similar lesion is present on the left side.

smooth, hard, and resistant to the touch, and quite painful, and the associated lymphnodes are swollen and tender. There is apparently no suppuration, and no hemorrhage ensues when the plug is detached. The lesions heal within six or eight days, leaving soft, pliable, grayish scars of irregular outline which imperceptibly fade into the healthy contiguous tissue. The mucous surfaces of the cheeks and lips are affected with about the same degree of frequency. The sides and under surface of the tongue are attacked more often than the dorsum. The lesions are usually single, but two or three may be present at one time. The ulcers are quite painful, and so sensitive to irritation

that frequently the patients dispense with eating for many hours at a time because of the entailed suffering.

Etiology and Pathology.—The essential cause of the disorder is unknown. Loblowitz states that the ulcers occur in the mouth after puberty, and disappear when the patient is about thirty, but in the

Fig. 910.—Periadenitis mucosa necrotica recurrens. Section from a lesion on tongue. Low magnification.

case under my observation, the disease had been present since early infancy. Secondary infection with ordinary pus cocci, Vincent's organisms, and similar bacteria frequently occurs. Histologically, the disease is characterized by an intense inflammatory process in the periglandular tissues, with ensuing necrosis, and the separation of

the central portion of the affected area. I at first believed the disorder to be paratuberculous, but have since concluded that it is not. Loblowitz considers that it is probably of angioneurotic origin, and due to irritation of the vasomotor center by psychic stimuli.

Prognosis and Treatment.—The course of the affection is but little influenced by treatment. In the case under my care, outdoor sleeping, light exercise, and plentiful amounts of nourishing, easily digested food, with cod-liver oil, iron, and arsenic internally, proved beneficial.

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